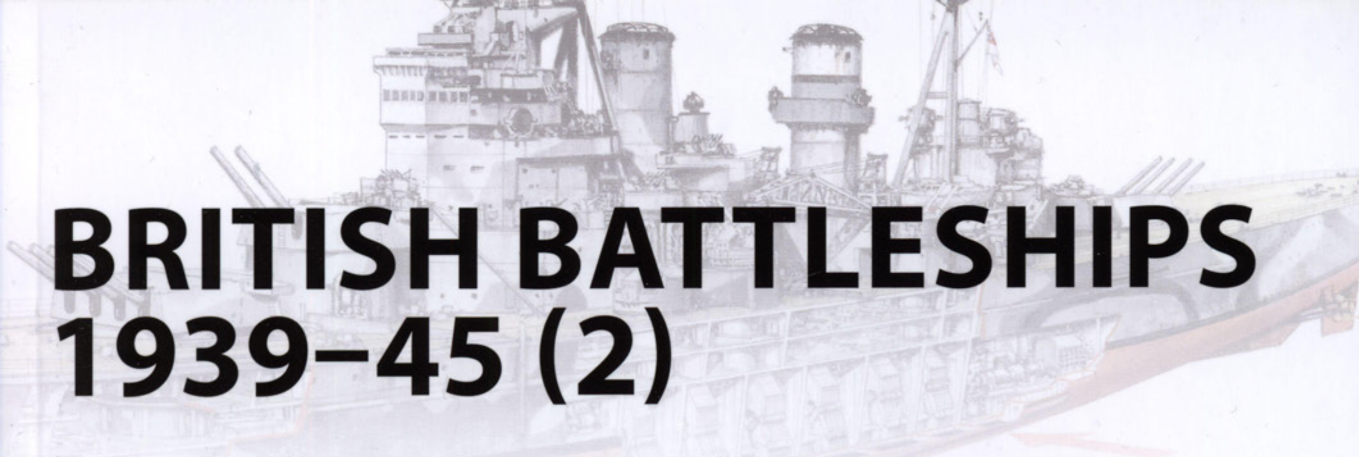
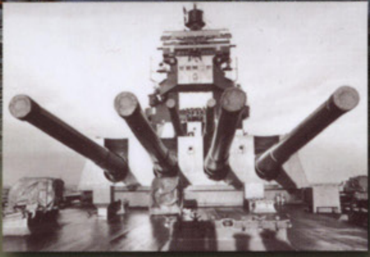


BRITISH BATTLESHIPS 1939–45 (2)

Nelson and *King George V* Classes



ANGUS KONSTAM ILLUSTRATED BY TONY BRYAN & PAUL WRIGHT

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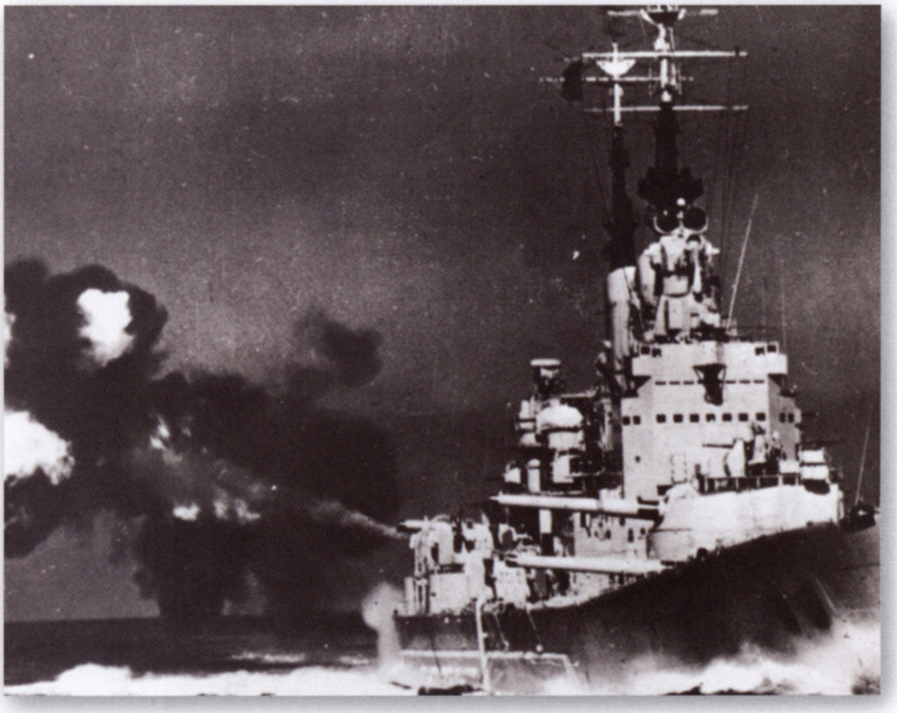
BRITISH BATTLESHIPS 1939–45 (2)

Nelson and *King George V* Classes



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CONTENTS

INTRODUCTION 4

DESIGN AND CONSTRUCTION 5

- The Washington Treaty
- The *Nelson* class
- The *King George V* class
- The *Lion* class
- The *Vanguard*
- Armament
- Service Modifications

SERVICE HISTORY 39

- *Nelson* class
- *King George V* class

BIBLIOGRAPHY 46

INDEX 48

BRITISH BATTLESHIPS 1939–45 (2)

NELSON AND *KING GEORGE V* CLASSES

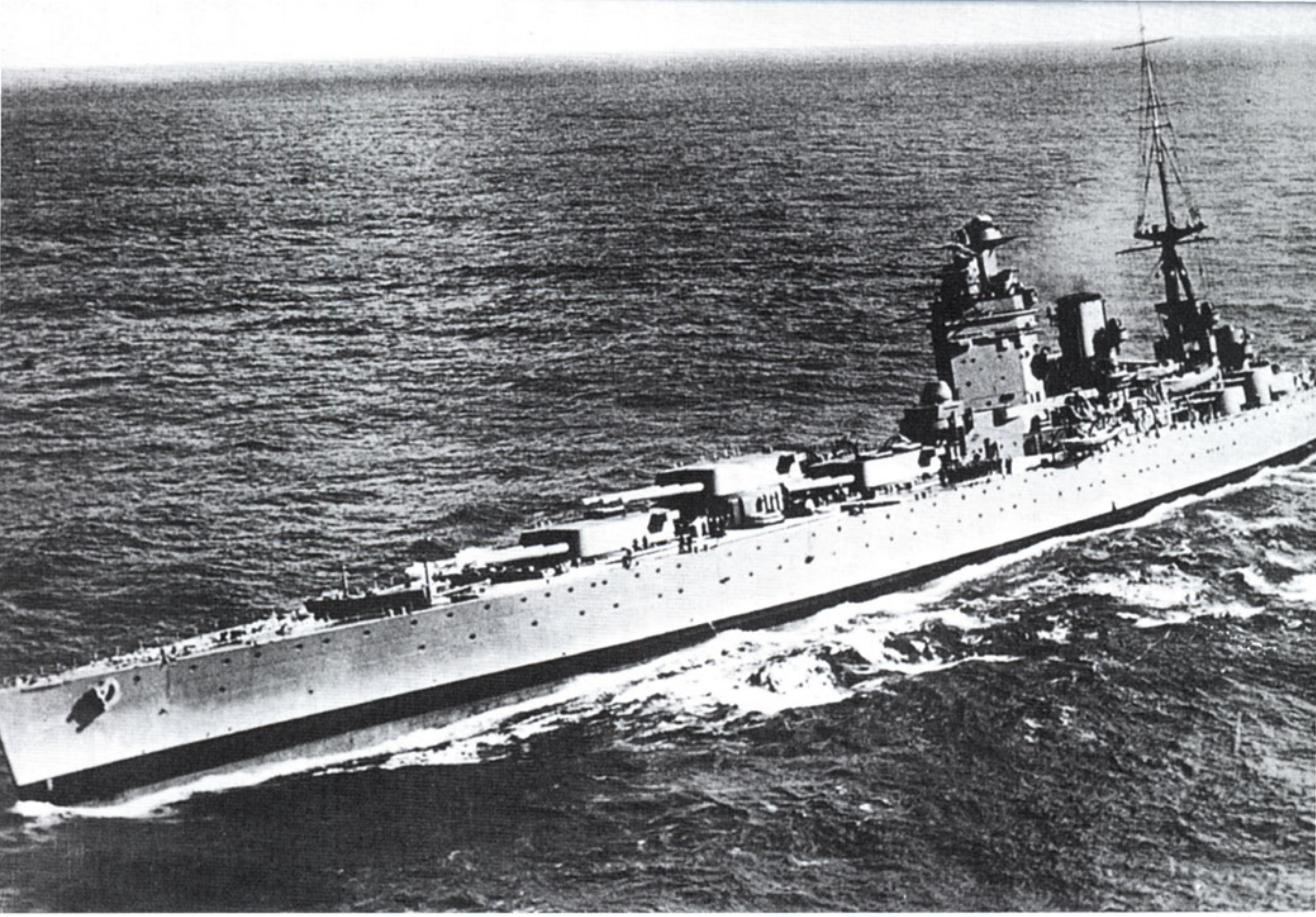
INTRODUCTION

When World War I reached its bloody conclusion in November 1918, Great Britain had the largest and most modern battlefleet in the world. It consisted of 33 modern dreadnoughts, plus another 12 battlecruisers, and an aircraft carrier. This did not even include the 31 surviving pre-dreadnought battleships in the fleet, or the 146 cruisers, or hundreds of smaller vessels. Clearly this was all more than the exhausted post-war economy of Britain could afford, and so the British government became eager supporters of arms treaties designed to limit the number of warships in the world's fleets. After all, nobody could afford another naval arms race like the one which preceded the "Great War."

The result was the Washington Conference of 1921, at which the former Entente powers of Great Britain, the United States, France, Japan and Italy all agreed to limit the size and fighting potential of their respective navies. The agreement severely restricted the size of existing fleets, as well as the tonnage of any new capital ships. Still, this allowed the British politicians to dispose of most of the Royal Navy's battlefleet, which they did with great alacrity. In truth, many of the earlier dreadnoughts had already become obsolete, as their armament of 12-inch guns was outclassed by the latest warships, which carried 16-inch ordnance.

Under the terms of the Washington Treaty the British were able to build two replacement battleships, although allowable tonnage was limited. The result was the two modern battleships of the *Nelson* class, which were laid down in late 1922 and entered service in 1927. By then the strength of the active battlefleet had been reduced even further; apart from these two new vessels it consisted of just ten ageing battleships and three battlecruisers. The same financial and political constraints which led to the culling of the fleet would continue to affect the Royal Navy for most of the inter-war period. Worldwide recession meant that most naval powers preferred to renew the treaty when it lapsed. As a result no new battleships were commissioned for almost 15 years.

By 1937 the naval balance of power had changed. Germany was rebuilding its battlefleet along modern lines, while Japan and Italy had shaken off the shackles of their treaty obligations, and had started to expand their own fleets. Finding itself at a disadvantage, Britain commissioned its own new class of battleships, all of them laid down during 1937. None had been completed by the outbreak of World War II just two years later. Consequently, the Royal Navy was plunged into a global conflict for which it was ill-prepared. Until these new battleships could enter service, the existing battlefleet would have to hold its



own against a growing group of enemies whose fleets included some of the most modern and powerful warships in the world. This book tells the story of these "Treaty battleships," and the capital ships which were designed to counter the growing threat posed by Germany, Japan and Italy.

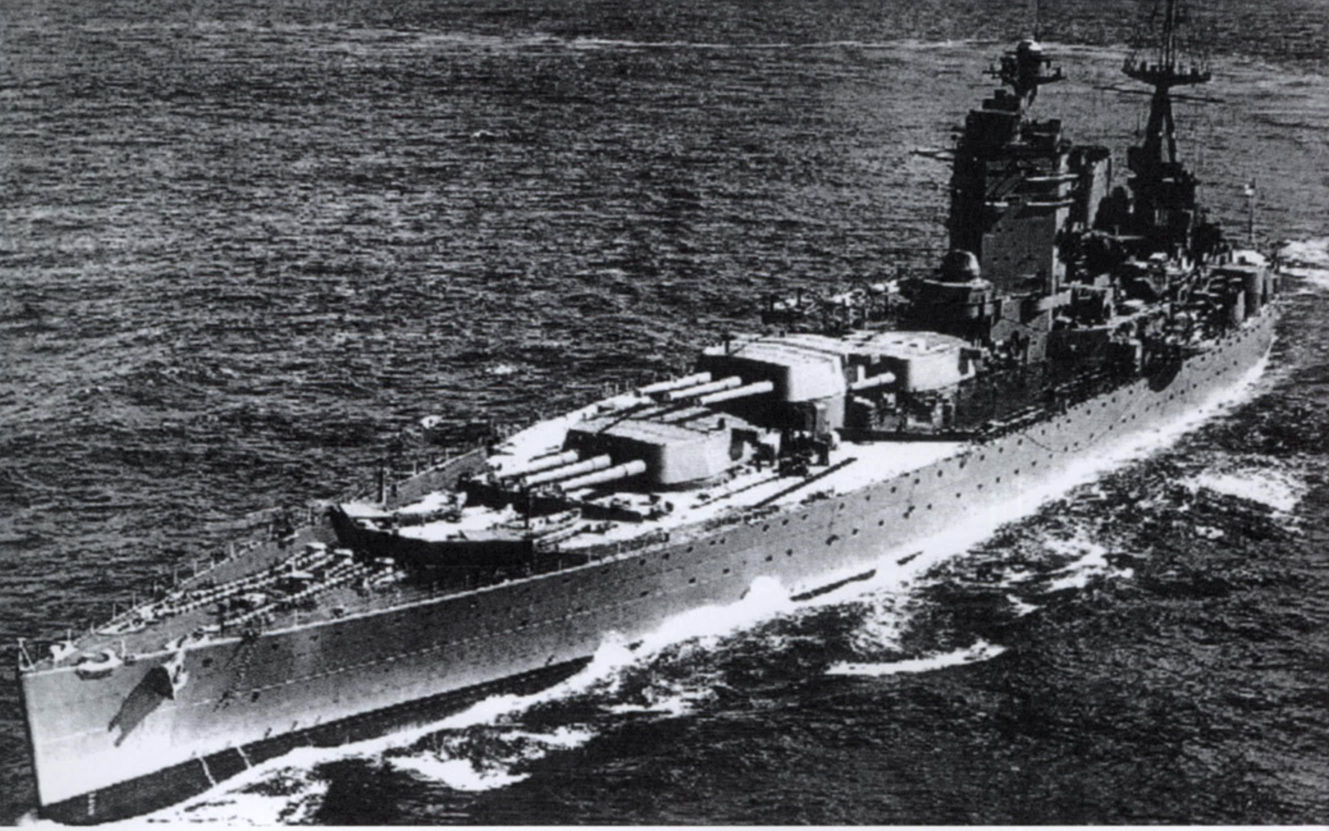
HMS *Rodney*, photographed during a pre-war exercise in home waters. Despite the ungainly hull, these battleships were weatherly and considered good "sea boats." The hull shape also made these battleships extremely stable gun platforms.

DESIGN AND CONSTRUCTION

The Washington Treaty

Economic historians claim that the "Great War" cost the British taxpayer just over £20 billion ($36 billion). Other countries in the Empire such as Canada, Australia, India, New Zealand and South Africa added another £3 billion to the war chest. The British Treasury was exhausted, the ties of Empire were weakened, and two decades later the British government was still trying to pay off its war debts. Other members of the wartime Entente were in a similar position: France spent the equivalent of $24 billion during the war, the United States spent $22 billion, Italy $12 billion, and Japan around $40 million. With the exception of the United States, all these costs were roughly in proportion to the economic standing of the various countries before the war began. That meant that victory came at a huge price, not just in lives, but also in money.

It therefore made sense that, in the aftermath of the "war to end all wars," the Allies would no longer need the battleships which helped to secure victory at sea. Britain still had the largest battlefleet in the world with 45 battleships and battlecruisers. The United States Navy had 16 capital ships (with three more on the stocks), while the French Navy had 12 dreadnought battleships, the Italians five and the Japanese four. In addition, all these navies had a number of obsolete



HMS *Nelson*, pictured at the start of World War II. The ungainly appearance of the *Nelson* class battleships was largely due to the need to make the most of the tonnage while still complying with the limits imposed by the Washington Treaty.

pre-dreadnoughts still in service, and a large fleet of smaller vessels. In the immediate aftermath of war all these countries embarked on new shipbuilding programmes – ones they could ill afford. In 1920 the United States declared that it planned to produce a navy "second to none," and ordered 15 new capital ships. Japan countered this by embarking on its own ambitious plan to build 16 modern battleships and battlecruisers. For its part Britain designed four new large battlecruisers (known as the "G3" battlecruisers), and four fast battleships (under the "N3" programme).

By 1921 it seemed clear that the world was embarking on a new naval arms race, and of the countries mentioned only the United States had the economic wherewithal to see the programme through. However, growing support for isolationism meant that the US government lacked the political support this programme required. Britain and Japan were also linked by an alliance which meant they were able to negotiate over matters such as naval construction and expenditure, as long as the strategic interests of both countries were served. The US government saw that if the US joined in these negotiations, all three countries could avoid the need to embark on costly shipbuilding programmes just to maintain their strategic position. At the same time the American politicians would be able to appease the isolationists back home.

The result was an American-led initiative to hold a naval conference in Washington. By the time the conference convened in November 1921, France and Italy had also come to the negotiating table. Obviously, all five naval powers wanted to reduce their naval budgets, but they also wanted to safeguard their own position in the naval rankings, and to maintain or improve their own strategic position. In other words, the conference involved a lot of diplomatic "horse-trading". The United States wanted to limit the naval power of Japan, Britain wanted to maintain its naval lead, while France and Italy both wanted to counter British seapower in the Mediterranean.

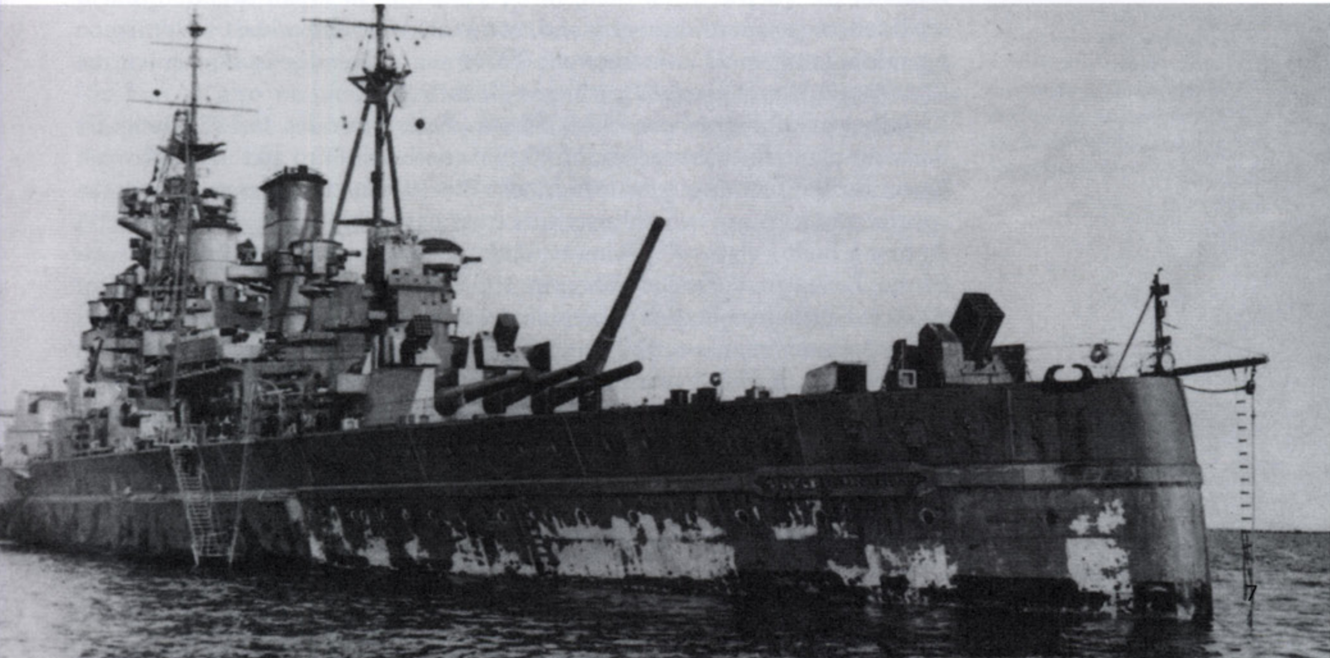
In the first disarmament conference in history, the five powers approved a series of limits on both the size of existing fleets and the construction of new warships. The total tonnage of capital ships in each fleet was set at 525,000 tons for Britain and the United States (with an additional 135,000 tons allocated for aircraft carriers), 315,000 tons for Japan (plus 81,000 tons for carriers), and 175,000 tons (plus 60,000 tons for carriers) for both France and Italy. This amounted to fewer than 20 battleships, which meant the Royal Navy would have to scrap almost half of its fleet of dreadnoughts.

In addition, no single ship could exceed 35,000 tons (excluding fuel and water), or carry anything larger than a 16-inch gun. For the purposes of the treaty the navies of the British Empire were lumped together into a single entity, effectively preventing Australia, Canada or New Zealand from developing their own fleets of capital ships. Germany had lost its fleet at the end of the war, so was not included in the treaty. In any case, the strength of the German fleet had been severely limited by the Treaty of Versailles (1919). Similarly, the newly-created Soviet Union was not invited to the conference, so was not included in the Washington Treaty, which was finally signed on 6 February 1922.

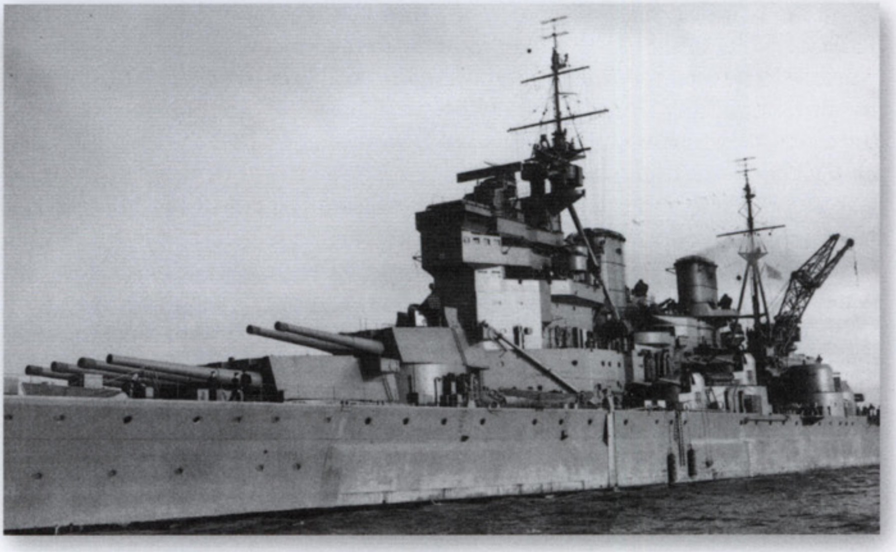
The big loser was the Royal Navy, whose strength was greatly reduced in the years that followed. However, the government saved money, and the naval balance of power was maintained. Between 1921 and 1922 the British battlefleet was reduced by 11 battleships and four battlecruisers. By late 1922 only 20 dreadnought battleships remained, of which almost a third were earmarked for disposal, or had been disarmed and turned into training vessels while waiting to join their fellows in the breakers' yards. A further four dreadnoughts would be sold for scrap between 1925 and 1926, and four more disposed of between 1928 and 1932. Two battlecruisers were also converted into aircraft carriers during the 1920s, leaving the Royal Navy with only a handful of active capital ships – five "fast battleships" of the *Queen Elizabeth* class, and five more of the *Royal Sovereign* class.

The building of the G3 battlecruisers and N3 fast battleships was cancelled, but in their place the British Admiralty ordered the designing of a new capital ship, which would conform to the 35,000-ton and 16in gun limitations imposed by the treaty. The result was the creation of the *Nelson* class of battleship. Two

A battered-looking HMS *King George V*, pictured at anchor in Scapa Flow in June 1941, after she had participated in the sinking of the German battleship *Bismarck*. One of the 14in guns has been raised to its maximum elevation of 50° for maintenance.



HMS *Prince of Wales* in Scapa Flow during April 1941, just a week after she was commissioned into service. The battleship was so new that civilian technicians were still aboard a few weeks later when she sailed into battle against *Bismarck*.



vessels of this class – HMS *Nelson* and HMS *Rodney* – were laid down in December 1922. The treaty meant no new battleships would be commissioned by the Admiralty until the late 1930s.

Eight years later, in 1930, the five naval powers met again, as the time limits imposed by the Washington Treaty were about to expire. The result was the London Naval Treaty, which was signed that April. Three years earlier a conference in Geneva had failed to achieve anything due to animosity between the delegates. This time the signatories agreed not to build any new capital ships until 1937, and to limit the conversion of existing vessels into aircraft carriers. Further limits were placed on the building of cruisers and submarines, and on the way submarines would be employed in any future war.

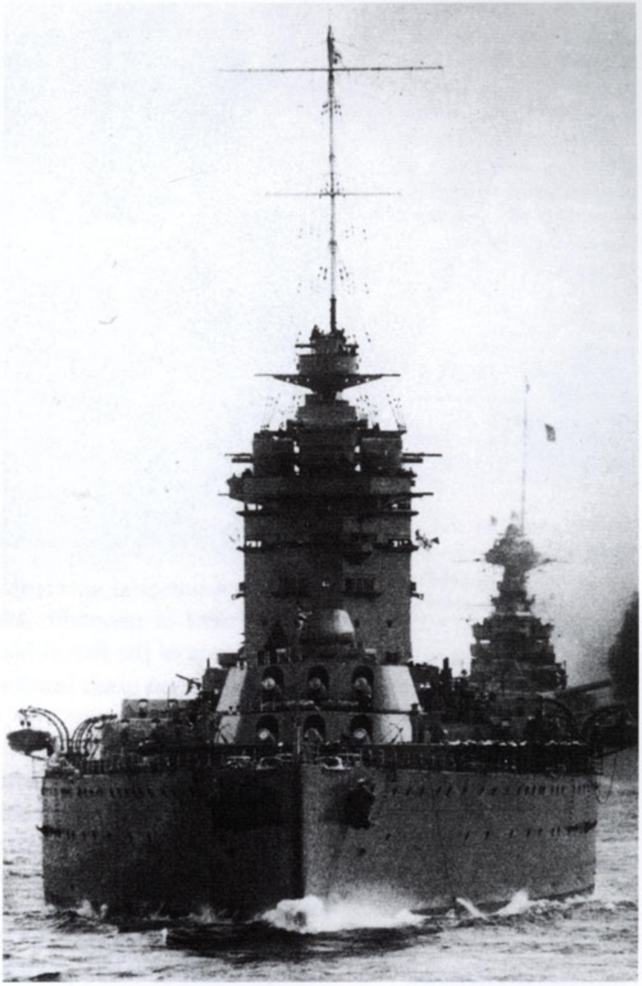
The trouble was, not all the signatories were willing to play by the rules. Japan felt snubbed by the 5:5:3 ratio which meant its fleet would always be smaller than those of Britain or the United States. However, British naval strength was split between three oceans, and the US maintained a two-ocean fleet, which effectively meant that Japan enjoyed parity with its potential rivals in the Pacific. Even then, in December 1934 Japan declared that it intended to opt out of the treaty and, two years later, embarked on a dramatic programme of naval construction. Three years later Japan laid down the 62,000-ton *Yamato*, armed with nine 18-inch guns.

Italy was another power which did not play by the rules. In 1930 designers drew up plans for a new class of 40,000-ton battleship, and in 1934 work began on the first two – *Littorio* and *Vittorio Veneto*. Then there was the spectre of Germany, which began its own battleship programme in 1929. At first it built a class of "pocket battleships" which complied with the terms of the Treaty of Versailles. Then in 1935 the first two of a new breed of modern German capital ships were laid down – the 35,000-ton battlecruisers of the *Scharnhorst* class. They were followed a year later by two 42,000-ton battleships – *Bismarck* and *Scharnhorst*.

Britain, France and the US still stuck by the terms of the Washington and London treaties, at least until the overall agreement lapsed in 1937. By that stage it was clear that any further attempt at maintaining a limit on naval growth was pointless, as Japan, Italy and Germany were clearly not going to return to the negotiating table. Consequently the Admiralty decided to build a new class of modern battleship – the first for 15 years. In fact the Admiralty already had plans to hand, although these were for ships designed to fall within the limits imposed by the Treaty of London. However, it was felt that as Britain now lagged behind its European rivals, speed of construction was a more important consideration than the classic naval trinity of armour, firepower and speed. The result was the commissioning of five battleships of the *King George V* class, all of which were laid down in 1937.

The decline in British naval seapower was never more marked than immediately before the outbreak of World War II. The battlefleet consisted of 12 battleships, three battlecruisers, and eight aircraft carriers of various sizes. Despite its small size, it still had to operate in three sub-units – the Home, Mediterranean and Eastern fleets. The US Navy was a two-ocean fleet, in 1939 comprising 15 battleships and seven carriers. The Imperial Japanese Navy boasted a force of six battleships, four battlecruisers, and six aircraft carriers, but it had the advantage of operating solely in the Pacific Ocean. Given the commitments of the Royal Navy in home and Mediterranean waters, the British would be sore-pressed to counter the growing Japanese naval threat in the Far East.

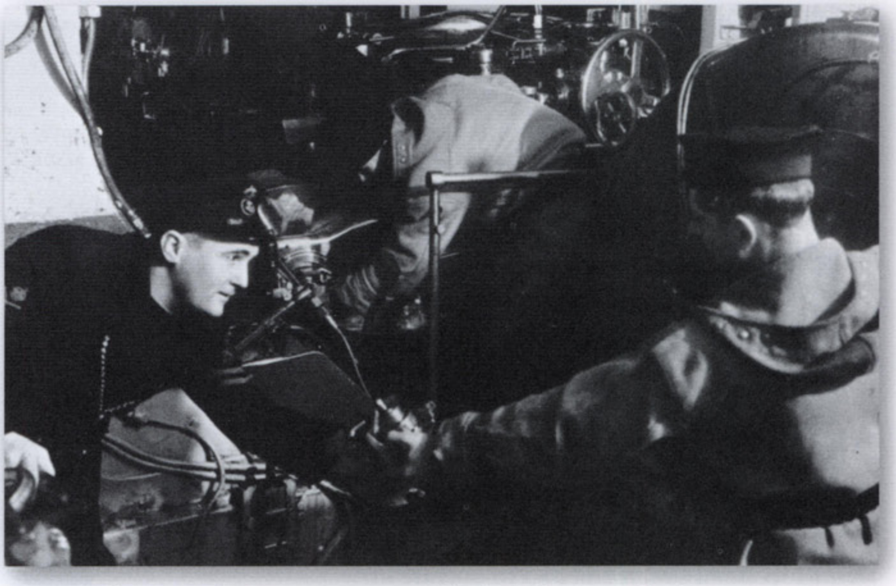
Germany only had two battlecruisers and three pocket battleships at its disposal, but more ships – most notably those of the *Bismarck* class – were nearing completion. The French possessed a fleet of five battleships with one more nearing completion, and one small aircraft carrier, while the Italian fleet consisted of four battleships, with two more being fitted out. Both of the latter small fleets were of primarily Mediterranean naval powers, although the French also maintained a small naval presence in the Atlantic. The German fleet was a direct threat to the British Home Fleet, but the perceived risk of either Italy or France entering a war on the side of their continental neighbours meant that the British also had to maintain a Mediterranean presence which was capable of countering the threat posed by these smaller naval powers.



HMS *Rodney* in early 1941, photographed from a bows-on angle which highlights the unusual appearance of the "citadel" bridge structure. The citadel was designed to be impervious to gas attack and to maximise visibility for the bridge staff and fire-control crew.

In other words, in 1939 Britain was desperately short of capital ships, and her global commitments meant that until the new *King George V* class vessels entered service, the remaining battleships and battlecruisers would have to hold the line against several potential rivals, all of which had more modern battlefleets. Of the ten British battleships, all but *Nelson* and *Rodney* were veterans of the World War I – many had last fired their guns in anger at the Battle of Jutland in 1916. This meant that when Britain entered World War II in September 1939, the two *Nelson* class battleships were vital strategic assets. Their loss could deprive Britain of her ability to defend her sea lanes – the

The interior of the turret of a *Nelson* class battleship, pictured while the gun crew perform routine maintenance checks. The operation of the three 16in guns was an almost completely automated business, so the smooth operation of the turret was vital to the effectiveness of the ship.

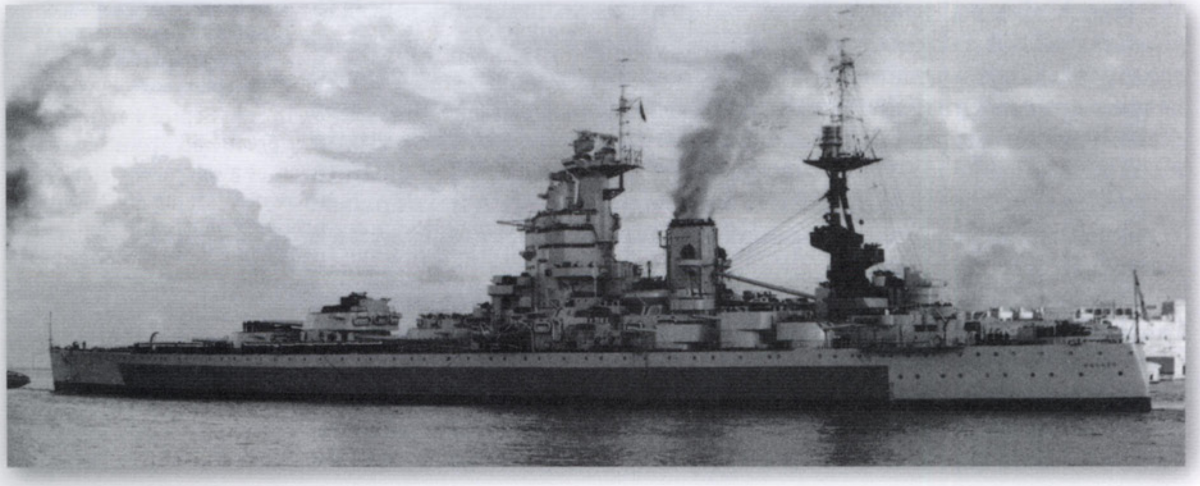


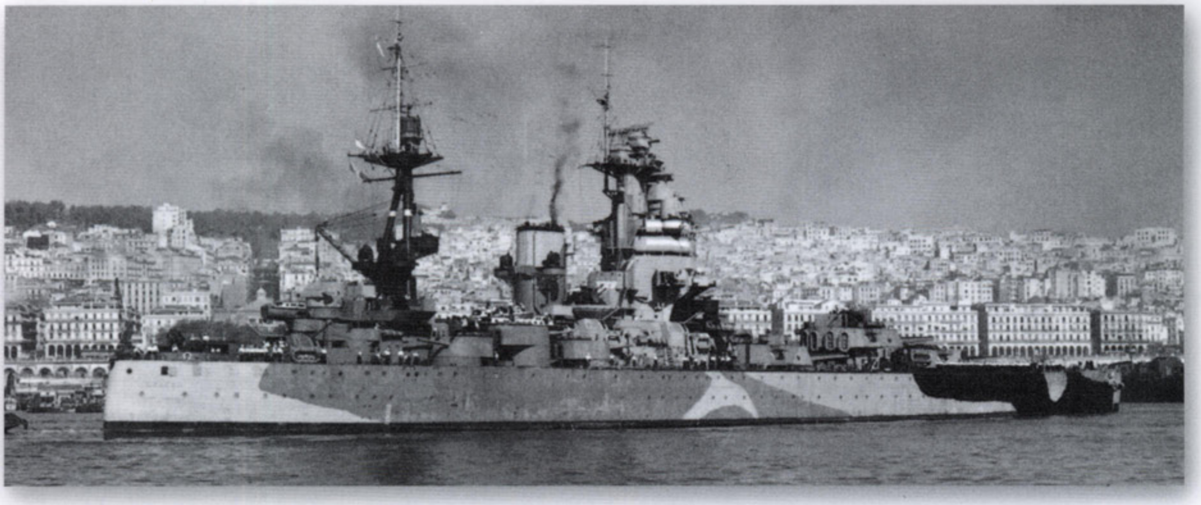
arteries of national survival. Worse still, their loss could also expose Britain to the threat of invasion. A lot more than national pride would ride on the performance of the Royal Navy in the dark months ahead, and on the fighting potential of two great battleships.

The *Nelson* class

Probably the only real benefit of the naval treaties for the Royal Navy was the building of two new battleships, designed to carry 16in guns. While the ships' design was a direct result of the limits imposed by the Washington Treaty (a maximum displacement of 35,000 tons, and a main armament of 16in guns or less), the designs also drew upon two earlier designs which never left the drawing board. As Director of Naval Construction from 1912 to 1924, Sir Eustace Tennyson d'Eyncourt (1868–1951) had already designed several important warships for the Royal Navy, including the *Royal Sovereign* class of battleships, as well as the battlecruisers *Repulse*, *Renown* and *Hood*. All of these were designed before the Battle of Jutland, at which important lessons were learned about watertight integrity, armoured protection and firepower. Tennyson was able to incorporate these lessons into his postwar designs.

HMS *Nelson* on 9 November 1945, returning to Portsmouth after serving the last months of the war in the Far East. The camouflage scheme was a simple pattern adopted for use by the Eastern Fleet.





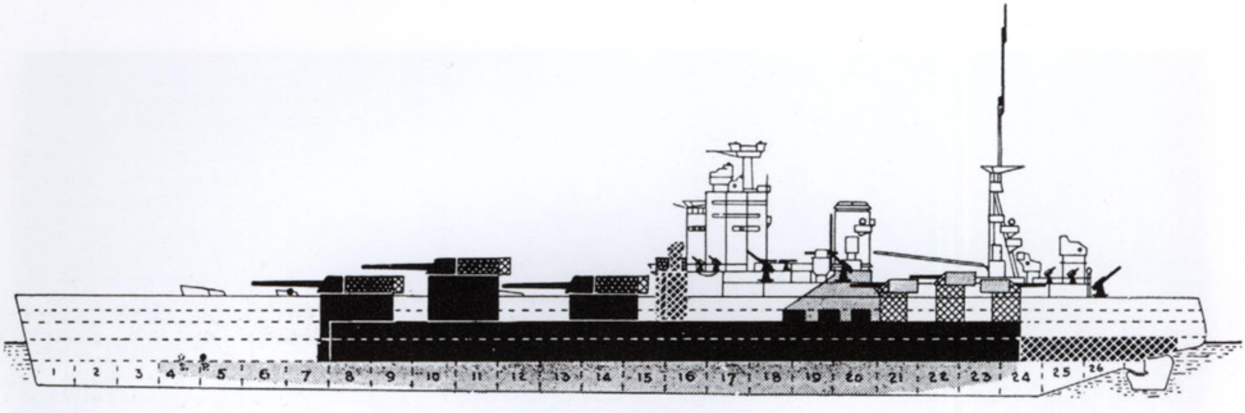
HMS *Nelson*, pictured entering the Free French port of Algiers in May 1943. At the time *Nelson* formed part of "Force H", based in Gibraltar. This view gives a clear indication of the camouflage scheme, which was retained until the late summer of 1944.

The G3 class of battlecruiser – the designation was a temporary one – was more like a "fast battleship" class than any previous British battlecruiser class, with an impressive armoured belt based on the "all-or-nothing" scheme advocated by contemporary American designers. This meant that armour was concentrated around the engines and magazines, but the rest of the hull was left virtually unprotected. The plan was to build four of these "super-battlecruisers", each with a displacement of 48,400 tons and carrying nine 16in guns in three triple turrets. Two would be located in the bow, and the third would be mounted amidships, between the forward superstructure and the twin funnels. These warships would be an imposing 856ft long (just 4ft shorter than HMS *Hood*), and would be powered by 20 boilers, capable of producing a top speed of 32 knots.

Tennyson's plans were accepted in February 1921, but by then the Washington Conference was about to take place, and events soon overtook the process of ship design. Orders were issued to four shipyards in late October, three in Glasgow (Clydebank) and one on Tyneside (the conurbation including Newcastle). However, as soon as the Admiralty learned of the proposed terms of the treaty these orders were suspended. The programme was finally cancelled in February 1922. Names were never allocated to these proposed vessels. Similarly, Tennyson also designed a class of four N3 battleships. These had a displacement, appearance and configuration similar to the battlecruisers' (48,500 tons, 820ft long, and an almost identical level of armour protection), but they were slower (capable of 23 knots), and – more importantly – they were designed to carry nine 18in guns, in three triple turrets.

These two classes of ship were the first battleships in the world to adopt triple turrets. Other designers had rejected the idea as too heavy, cumbersome and complicated. However, Tennyson saw this as a way to reduce the number of turrets, and hence concentrate the armour protection over a smaller expanse of hull. The 18in guns themselves were largely unproven; the actual performance of the triple 16in turrets suggested that the sheer power of these weapons would have made them dangerous to operate, as the blast effect would have posed a significant risk to the structure of the ship. The N3 battleship design was still in its final design stages when the signing of the Washington Treaty brought the project to a halt.

However, Tennyson was now asked to design a new class of battleship, drawing on his previous designs but fulfilling the obligations of the treaty. This



The armour of HMS *Nelson* was concentrated amidships, in a heavy 14in belt. Similar protection was afforded to the turret barbettes, but elsewhere the battleship was barely protected – an attempt to make the most effective use of the armour in a design where every ton of displacement had to be accounted for.

was quite a challenge, as the aim was to design the most powerful battleships possible while still limiting displacement to 35,000 tons. Fortunately Tennyson was able to draw on his earlier plans. For instance, the treaty imposed a maximum armament of 16in guns, and the use of triple turrets would reduce the need for a broad band of armour, especially if the three triple turrets were grouped together. Tennyson simply used the 16in turrets he had designed for the G3 battlecruisers, and concentrated the turrets on the forecastle, in front of the bridge. Secondary 6in armament in his earlier designs was grouped in twin turrets, and Tennyson used this system for the new class, although all six such turrets were grouped towards the stern, to counteract the grouping of the heavy guns further forward.

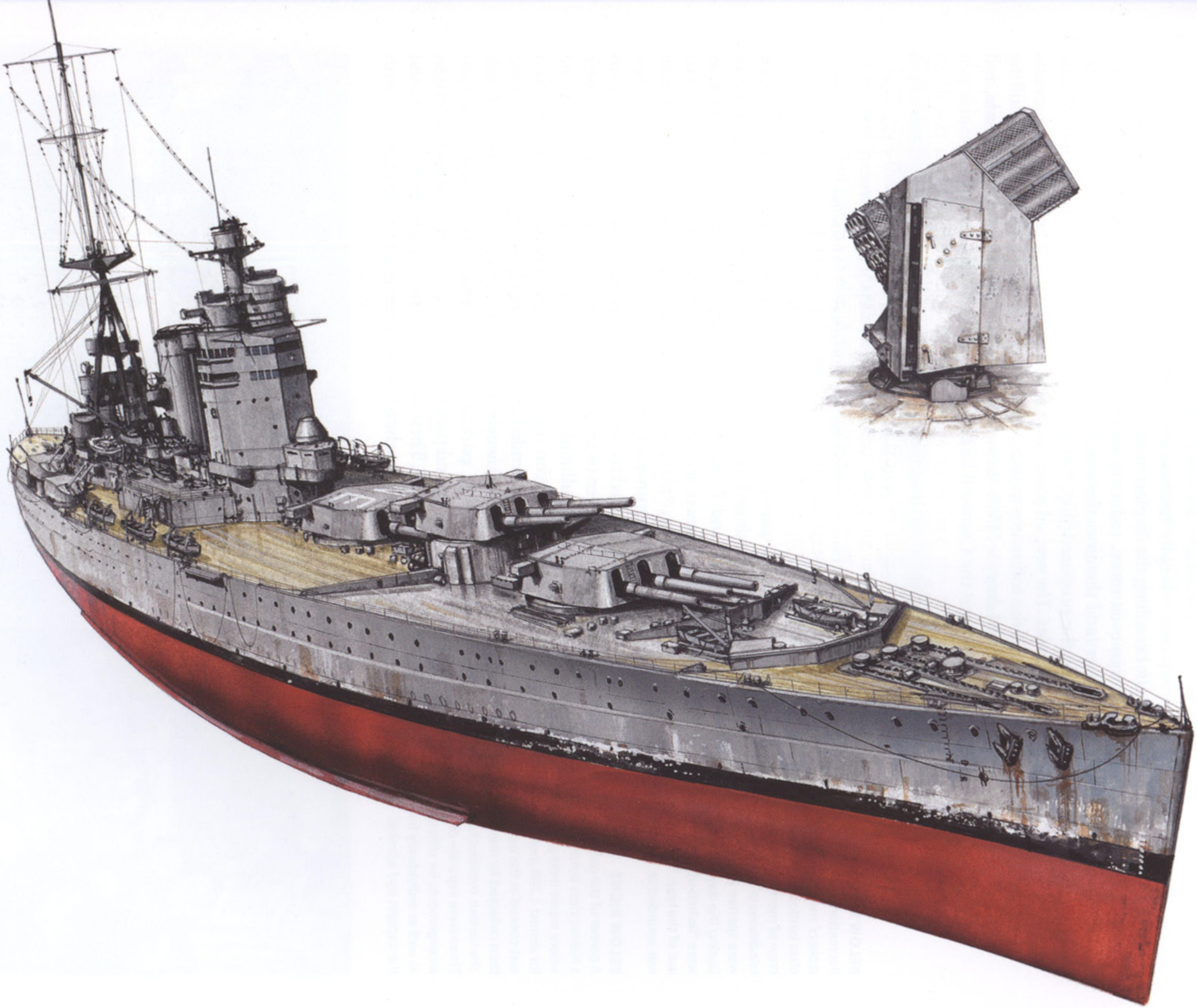
Amazingly, Tennyson produced his first sketch plans for these new battleships in November 1921, while the Washington conference was still under way. He was originally asked to design battlecruisers, but as the horse-trading continued it became clear that both the US and Japan planned to complete their own battleships with 16in guns, as work had already started on these. These eventually became the American *Colorado* class, armed with eight 16in guns in four twin turrets, and the Japanese *Nagato* class, which carried a similar armament. By employing three twin turrets and concentrating the armoured protection, Tennyson hoped to produce a superior design which would be capable of successfully engaging these rival battleships if the need arose. After all, when these two British battleships entered service they would be the most powerful warships in the world.

A

NELSON CLASS: HMS *NELSON* (1940)

The two battleships of the *Nelson* class were built according to the principles of compromise, and they looked it. The restrictions imposed by the Washington Treaty meant their designer was forced to make the most out of every ton of displacement. This accounts for the somewhat truncated and ungainly appearance of *Nelson* and *Rodney*. However, when they entered service in 1927 they were the most powerfully armed capital ships in existence. Despite the parsimony imposed by the economic recession of the inter-war years, these two battleships were still considered to be among the most powerful ships in the world when war broke out in 1939.

While these ships possessed a formidable main armament, as with all British battleships at the start of World War II their anti-aircraft defences were woefully inadequate. Their suite of 4.7in guns lacked an effective AA fire-control system until the spring of 1942, when a Type 285 radar system was fitted, allowing accurate co-ordination of long-range AA fire. One of the strangest weapons of the war was the Unrotated Projector, an AA rocket based on the parachute flare principle, which carried a mine suspended from a cable. The idea was to fire a barrage of these in the hope that enemy aircraft would fly into the dangling cables. The rockets were fired from 20-barrelled launchers, two each of which were mounted on *Nelson's* "B" and "X" turrets. Singularly unsuccessful, they were removed in late 1941.


B

The first two designs Tennyson submitted to the Admiralty in January 1922 were rejected – largely because there was no guarantee they could be built without breaching the displacement limit of 35,000 tons. Tennyson pared down the design even more, reducing superfluous armoured protection and limiting the power (and therefore the weight) of the engines. Tennyson also reduced the length of the proposed ship, but increased its beam to provide a more stable gun platform. The revised plans were finally approved in September. Contracts were issued the following month, and on 28 December the two vessels of the class were laid down – HMS *Nelson* at the Armstrong shipyard on Tyneside, and HMS *Rodney* at the Cammell Laird shipyard in Clydebank.

	Builder	Laid down	Launched	Completed	Fate
HMS *Nelson*	Armstrong, Tyneside	28 December 1922	3 September 1925	15 August 1927	Broken up 1949
HMS *Rodney*	Cammell Laird, Clydebank	28 December 1922	17 December 1925	7 December 1927	Broken up 1949

These were novel warships, and while their appearance might have been considered ungainly compared to that of earlier battleships such as those of the *Queen Elizabeth* and *Royal Sovereign* classes, they did at least pack as much armour and firepower into their 35,000 tons as they possibly could. The protective scheme was an "all-or-nothing" design, based on the latest ballistic experiments conducted against a captured German dreadnought. A main belt some 13–14in thick protected the ships' vitals, extending almost half the length of the vessel from "A" turret to the rear of the 6in gun turrets. The belt itself was built inside the outer hull and was sloped at a slight angle – 18° from the perpendicular. The gap between outer hull and armoured belt was used as a buoyancy space. The belt extended from six feet below the waterline to the gunwale of the upper deck. However, beyond this protective belt the hull was unarmoured – the "nothing" part of the "all-or-nothing" scheme. An anti-torpedo bulge formed an integral part of the hull, unlike with earlier battleships where this was an afterthought. These arrangements were designed to withstand the blast of a 750lb torpedo warhead or mine, and were multi-layered, with

BELOW LEFT
Recreation time in the stokers' mess of a *Nelson* class battleship. With a crew of more than 1,300 men, conditions in these battleships were spartan and cramped. During the day hammocks were "lashed up" in racks, out of the way. "Pipe down" was sounded at 10pm.

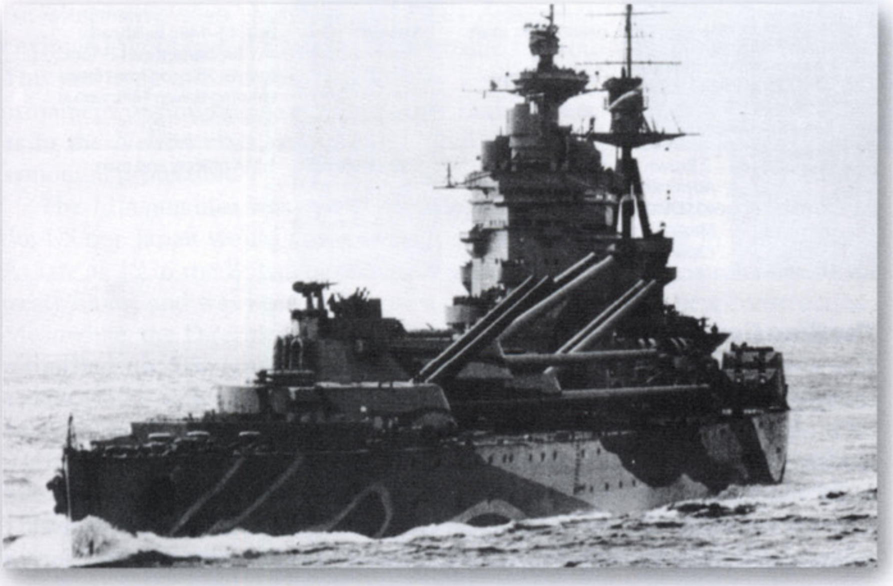
BELOW RIGHT
A corner of the galley on a *Nelson* class battleship, where meals were prepared for almost 1,200 men. Food was cooked in the galley, then collected by men from the various messdecks. There were separate dining arrangements for officers as well as individually for the captain and admiral.

a vacant outer chamber, a water-filled inner buoyancy chamber, a 1.5in-thick torpedo bulkhead, then a row of compartments, designed to limit the spread of flooding through the rest of the ship. The design of the bulge itself took advantage of the inward-sloping armoured belt to save internal space, which made good use of the space between the belt and the outer hull. The system was an ingenious one, and it may well have saved HMS *Nelson* on more than one occasion during World War II, as the ship seemed to be prone to hitting mines.

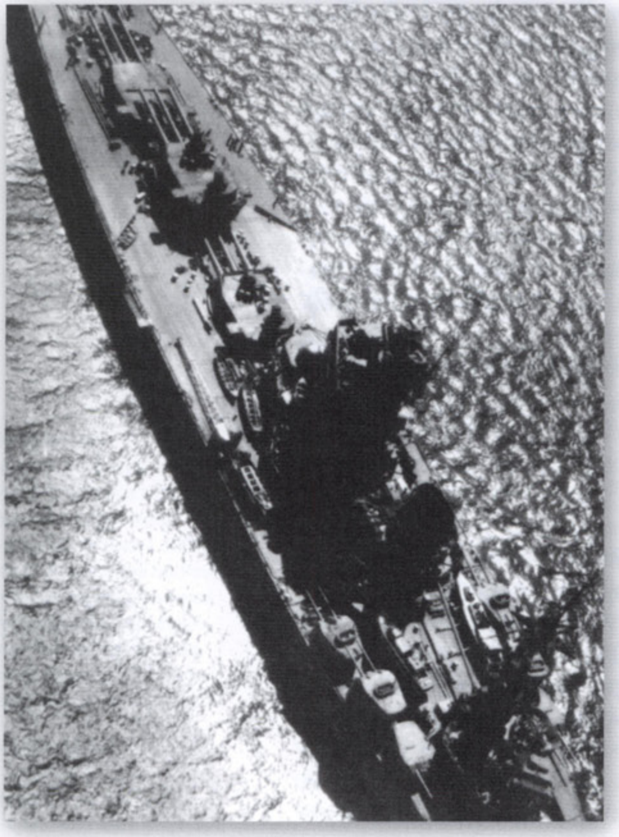
Plunging fire had presented a problem during the Battle of Jutland, so in the new ships the deck was well armoured, with 6¾in of protection over the magazines, 4¼in over the steering gear, and 3¾in over the engines. The hull itself was divided by armoured bulkheads to reduce the risk of internal explosions, while the three main turrets were protected in the standard fashion – with 15in-thick barbettes, and 16in turret fronts. In contrast, the secondary armament received only "splinter protection," meaning it was proof against a near-miss but not much else. Again, this reflected the "all-or-nothing" policy, as well as being another way for Tennyson to save weight.

The weakness of the *Nelson* class was its propulsion system. To save weight only eight Admiralty drum boilers were fitted, laid out with two per boiler room. Unusually, these were installed behind the engine rooms which housed the turbines, which in turn powered just two shafts, rather than the four shafts fitted in earlier British battleships. These boilers and turbines produced around 46,000 steam horsepower (shp), which was significantly less than the 75,000shp available to the battleships of the *Queen Elizabeth* class. During sea trials both battleships achieved speeds of just over 23 knots. This allowed them to keep up with the other, veteran, British battleships, but by 1939 such a speed capability was regarded as very slow compared with other, more modern vessels in rival navies.

What really set these ships apart from other warships was their armament. The 16in Mk I guns had already been ordered when the plans for these ships were approved – they had been earmarked for the G3 battlecruisers and the orders had never been cancelled. The guns themselves were largely unproven, and it soon became apparent that they lacked the accuracy and reliability of earlier 15in weapons. They were also prone to barrel wear, at least until the



HMS *Rodney* in June 1944, photographed as she engaged in naval gunfire support off the Normandy beaches. The ship proved particularly effective in this role, as her guns were capable of firing at enemy targets up to 20 miles inland. (MoD)



An aerial view of HMS *Rodney*, taken in mid-1941, shortly after the battleship participated in the sinking of the German battleship *Bismarck*. The strange configuration of the armament meant there was little deck space behind the superstructure on which to place extra anti-aircraft guns.

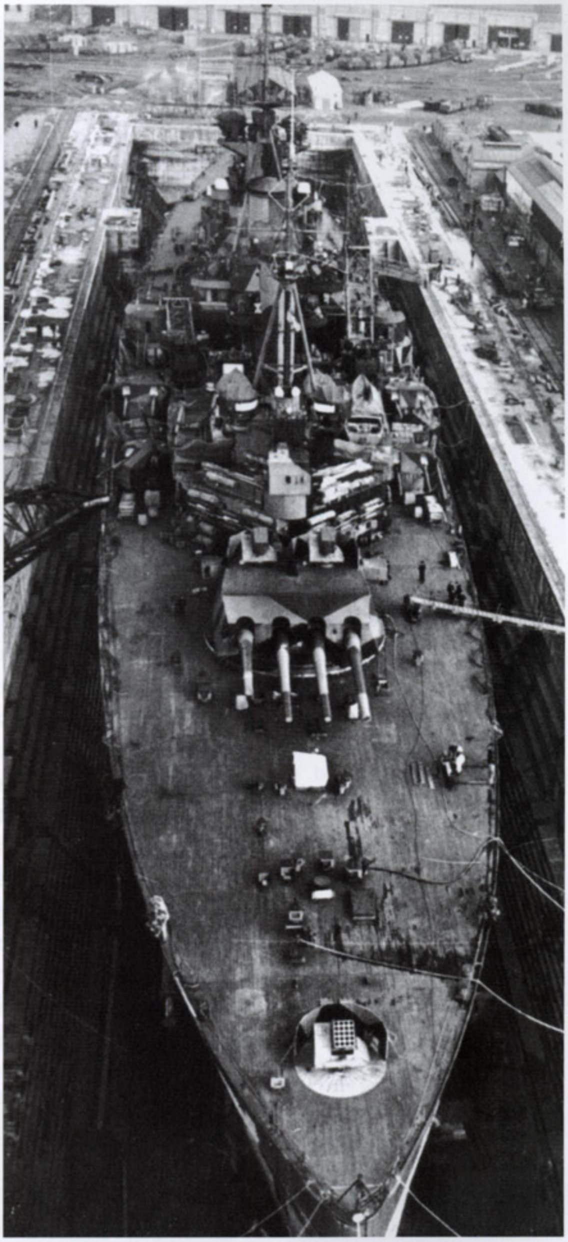
shells themselves were modified shortly before the outbreak of World War II. However, the guns packed a powerful punch, and could fire a two-ton shell almost 20 nautical miles.

Fire-control direction was provided from two director towers, one sited on top of the bridge, the other behind the shelter deck. Four other directors were provided for the 6in secondary armament, while two more abreast of the funnel provided guidance for torpedoes fired from submerged torpedo tubes. However, the latter form of weapon was by now obsolete, and its use was soon discontinued. The triple 16in gun arrangements proved problematic, as their complexity meant that the guns were difficult to operate and that they maintained a slower rate of fire than guns in a more conventional turret. However, by 1939 many of these faults had been overcome, and while the *Nelson* class battleships themselves might have been slow and outdated in comparison with more modern ships, their firepower was still impressive. When HMS *Rodney* encountered the German battleship *Bismarck* in May 1941, *Rodney*'s guns clearly demonstrated their worth against a modern opponent.

***Nelson* class (as built)**			
Displacement	33,313 tons (*Nelson*), 33,730 tons (*Rodney*) (standard)	Armament	9 x 16in Mk I BL guns, in 3 triple turrets; 12 x 6in guns in 6 twin turrets; 6 x 4.7in anti-aircraft guns in single mounts; 8 x single 2-pdrs; 4 x 3-pdr saluting guns in single mounts; 2 x 24.5in submerged torpedo tubes
Dimensions	length 710ft, beam 106ft, draft 28ft 1in	Armour	Belt: 13–14in; bulkheads: 4–12in; barbettes: 12–15in; turrets: 16in (on front face); conning tower: 14in; decks: 3.75–6.5in
Propulsion	2 Brown & Curtis turbines, 8 Admiralty boilers, producing 45,000 steam horsepower Maximum speed: 23kt Fuel oil capacity: 3,800 tons	Complement	1,314 officers and men

The *King George V* class

The terms of the 1930 Treaty of London extended the ban on battleship construction introduced in 1922. This new agreement expired on 31 December 1936, by which time it was clear that Great Britain was woefully short of modern capital ships. During this period the battlefleet was reduced even further, as the old *Iron Duke* class dreadnoughts *Marlborough*, *Benbow* and *Emperor of India* were all disposed of between 1931 and 1932. The *Iron Duke* itself – Admiral Jellicoe's flagship at Jutland – was disarmed and converted into a training ship. Apart from the ten more modern battleships of the *Queen Elizabeth* and *Royal Sovereign* classes, all of Jellicoe's dreadnought fleet had now been sunk, sold, converted or scrapped.



HMS *King George V* in dry dock in Rosyth, viewed from astern and photographed from the top of a dockyard crane in August 1940. The battleship had only just been completed and was being equipped and made ready for active service.

By New Year of 1937 it was obvious that the Royal Navy needed a new class of battleship. A new arms race had begun. Germany had built its *Deutschland* class of pocket battleships, the two battlecruisers of the *Scharnhorst* class had already been launched, and two battleships of the *Bismarck* class had just been laid down, along with an aircraft carrier. France had just launched two battleships of the powerful *Dunkerque* class, and another even more powerful battleship – *Richelieu* – was being built in Brest. In Italy two new *Littorio* class battleships had been laid down, while Japan had recently abandoned the London Treaty and was embarking on its own battleship and aircraft-carrier building programme. There-armament of the battlefleet was now vital to Britain's national interests.

Fortunately, the Admiralty had a plan. As early as 1933 designs had been produced for a new class of battleships which complied with the terms of the Washington and London treaties. The terms stipulated a tonnage limit of 35,000 tons and an armament of 16in guns or less. In fact, the Admiralty plans called for 12in ordnance – a smaller calibre of gun than those mounted in any British battleships built for a quarter of a century. The original design called for a battleship with eight 12in guns mounted in four twin turrets. This was in line with a treaty proposal to reduce the size and firepower of newly-built battleships. The 12in gun had a higher rate of fire than larger-calibre guns, so the plan was not completely a retrograde step. An alternative plan that had also been drawn up envisaged mounting the guns in three triple turrets. This new type of battleship would have a secondary armament of 6in casemate guns rather than turrets as in the *Nelson* class, and a substantial degree of armoured protection.

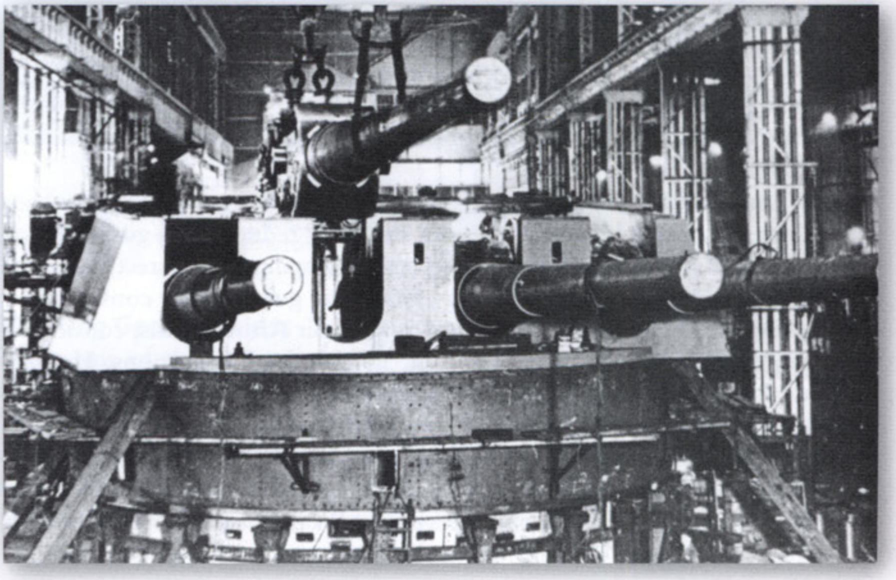
The 12in gun idea was quietly abandoned when it was realised that neither the US nor Japan would agree to such a dramatic reduction in gun calibres. As late as 1936 the British government was still hoping to resurrect the naval treaty limits, and was keen to impose a cap of 14in guns on new construction. Meanwhile, the Director of Naval Construction, Sir Arthur Johns, considered using larger-calibre guns, including 15in, 16in and 14in weapons. He also experimented with a range of mountings, including triple- and quadruple-gun turrets. The aim, however, was to build a battleship which still complied with the treaty requirements, and in a second London Treaty in March 1936 the British succeeded in setting the maximum calibre of new battleship guns at 14in. This meant that Johns was given no leeway by his political masters – the new battleships would have to conform to the largely self-imposed treaty limits.

The rum ration on a *King George V* class battleship. Rum was issued daily to all seamen over the age of 20. The daily ration per man was half a gill (2½ fluid ounces, or 142 ml), diluted with an equal part of water. Chief petty officers and petty officers were allowed to draw their rum neat.

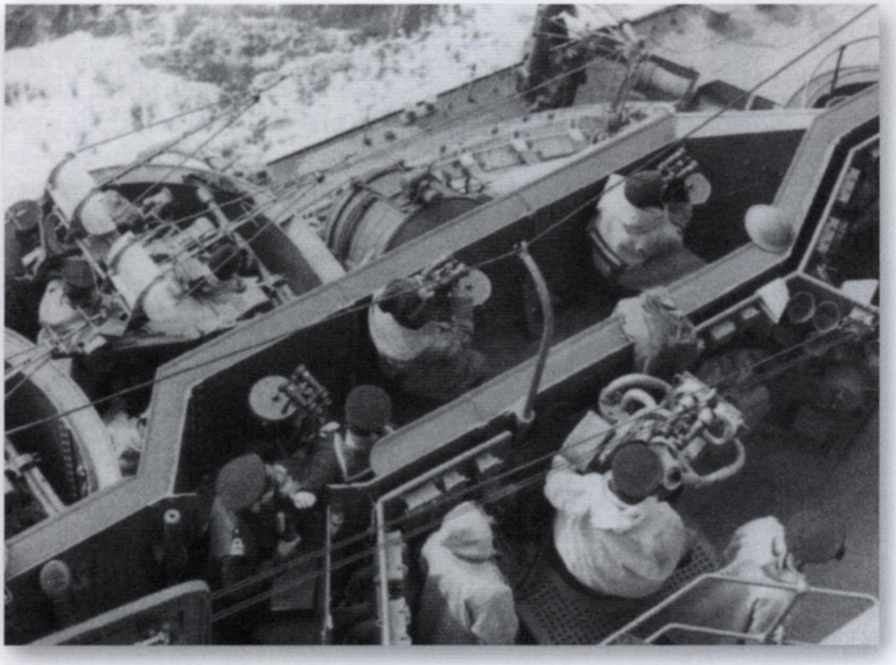
When it became clear within a few months that nobody but the British were going to stick to this new agreement, it was abandoned. By that time it was too late to change the designs of the planned battleships or the calibre of their guns.

Still, regardless of the capping of calibres, the ships had been designed within the framework of the treaty limit of 35,000 tons. If Britain wanted to stay ahead in the new naval arms race, there was no time to redesign the proposed battleships, but at least nobody would now object if the finished vessels crept over the 35,000-ton limit. This displacement restriction meant that any new warship design was quite limited in terms of the overall weight of its ordnance. This effectively meant that the heavier the armament, the fewer guns could be fitted. The 14in gun was based on the experimental 12in Mk XVI gun design originally proposed for the new battleships, so represented an upgrade. Despite being foisted on the Royal Navy by politicians, the 14in Mk VII BL gun proved to be a highly effective piece of ordnance.

Sir Arthur Johns' latest ship design therefore carried a powerful armament of ten 14in guns, mounted in two revolutionary quadruple turrets plus one other straightforward twin mounting. Johns had earlier considered mounting the 12 guns in four triple turrets, but eventually opted for a twin turret, which allowed the weight saved to be used to increase the battleship's armour protection. The retrograde notion of mounting the secondary armament in individual casemates was abandoned in favour of 20 dual-purpose (DP) 4.5in guns in ten twin turrets, capable of engaging both air and surface targets. However, by the time construction began these had in turn been replaced by 16 of the latest 5.25in DP guns, in eight twin turrets.



Installing the guns into the quadruple Mk III turret of a *King George V* class battleship in the Vickers-Armstrong ordnance factory at Elswick, Lancashire. These 14in guns were based on the design of earlier experimental 12in guns, and proved to be highly effective weapons.



The port side of the open bridge of HMS *Prince of Wales*, with men manning light anti-aircraft gun directors on the bridge wings. Beyond can be seen a Type 285 radar, mounted atop a High-Angle Control System (HACS) director, which was capable of providing both visual and radar-guided fire-control solutions to the battleship's heavy anti-aircraft guns.

Armour consisted of a 15in-thick belt protecting the magazines and engines, tapering to just 4.5in below the waterline. The armour stretched from the forward to the after turret barbettes – some 414ft overall. The whole belt was almost 24ft wide, covering most of the hull and extending 8ft below the waterline. The deck was protected from plunging fire by 6in of armour plating over the magazines and 5in over the engine rooms, extending the same length as the armoured belt. In effect, the scheme created a large armoured citadel, which ended in two 10–12in-thick armoured bulkheads.

The whole protective scheme was intended to be proof against 15in shells – the largest calibre the British expected to encounter in any war involving Germany or Italy. Of course, it was not particularly effective against the 18in guns of the Japanese *Yamato* class, but, then again, at the time when the British battleships were designed, these Japanese battleships had not even been laid down. Forward and aft of the main citadel the armour was extended another 40ft each way, although the thickness was reduced to a maximum of 11in. For protection against torpedoes these battleships had a sandwich" built-in torpedo bulge. This comprised three layers of protective plating, creating two vacant spaces on each side of a water-filled central section.

Shrapnel damage to the funnel of HMS *Duke of York* following her engagement with Scharnhorst in December 1943. During the dramatic battle, fought in rough seas and near-zero visibility, the British battleship relied on radar to locate and engage the German battlecruiser.

The propulsion system for these new battleships consisted of eight Admiralty boilers with superheaters, in four boiler rooms, and four turbines, each serving a propeller shaft. The configuration was a little more conventional than for the *Nelson* class, with boiler rooms placed side by side and with each pair associated with a turbine room astern of them. All this machinery produced

HMS *Duke of York* returning to Scapa Flow on 1 January 1944, after sinking *Scharnhorst*. She was cheered to her moorings by the rest of the fleet and by the crew of a mooring drifter, pictured in the foreground. As Admiral Fraser's flagship, *Duke of York* moored on "A" Buoy, which was fitted with a telephone link directly to the Admiralty in London.

100,000shp, giving the ships a top speed of 28kt. This made them faster than the rest of the British battlefleet but slower that the latest German or Italian capital ships – in the event, the very vessels these new British battleships would have to face on the high seas.

The first two ships were ordered as part of the 1936 Programme, which was approved when it became clear that the 1936 naval treaty was a lame duck. These became the *King George V* – which provided the name for the class – and the *Prince of Wales*, which were ordered in July 1936, and laid down on New Year's Day 1937. The 1937 Programme, which called for the building of three more battleships, was approved in late 1936, allowing work to begin the following summer. These last three battleships were to be called *Anson*, *Jellicoe* and *Beatty*. The original *Anson* was renamed *Duke of York* in 1938, while still under construction in Clydebank. It was also decided not to name the two remaining battleships after *Jellicoe* and *Beatty*, British

	Builder	Laid down	Launched	Completed	Fate
HMS *King George V*	Vickers-Armstrong, Tyneside	1 January 1937	21 February 1939	11 December 1940	Broken up 1958
HMS *Prince of Wales*	Cammell Laird, Clydebank	1 January 1937	3 May 1939	31 March 1941	Sunk in action, 10 December 1941
HMS *Anson*	Swan Hunter, Tyneside	20 July 1937	24 February 1940	22 June 1942	Broken up 1958
HMS *Duke of York*	John Brown, Clydebank	5 May 1937	28 February 1940	4 November 1941	Broken up 1958
HMS *Howe*	Fairfield, Clydebank	1 June 1937	9 April 1940	29 August 1942	Broken up 1958

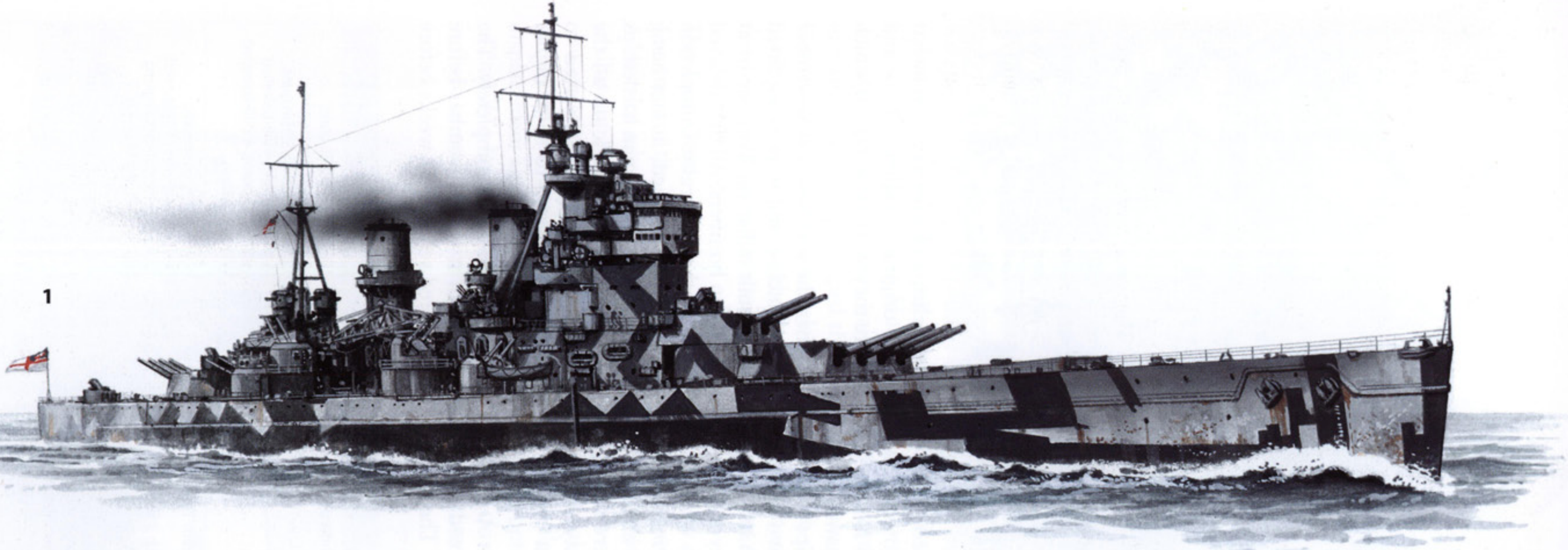
B

HMS *KING GEORGE V*, 1941 AND 1945

In May 1941 HMS *King George V* flew the flag of Admiral Tovey, commander of the Home Fleet. At 11pm on 23 May the ship sailed from Scapa Flow in an attempt to intercept the German battleship *Bismarck*. The news that *Hood* had been sunk and *Prince of Wales* damaged was devastating, but served to steel the resolve of the battleship's crew to avenge the men who had been lost. Their chance came on the morning of 27 May, when *King George V* and *Rodney* finally caught up with the German warship. At 8.50am Tovey's flagship opened fire, and within an hour *Bismarck*was shattered and blazing. By 10am *King George V* had closed to within two miles, and was firing directly into the floating wreck. Tovey ordered his battleships to disengage shortly afterwards, and *Bismarck* was finished off with torpedoes.

The upper picture (**1**) of *King George V* shows the battleship as she looked during this momentous battle. By contrast the lower picture (**2**) shows the battleship as she looked almost four years later, when she fired her guns at targets on the Japanese mainland. In between an additional 38 anti-aircraft mounts were added, including 26 single 20mm guns and four extra eight-barrelled 2-pdr (40mm) pom-poms.

1



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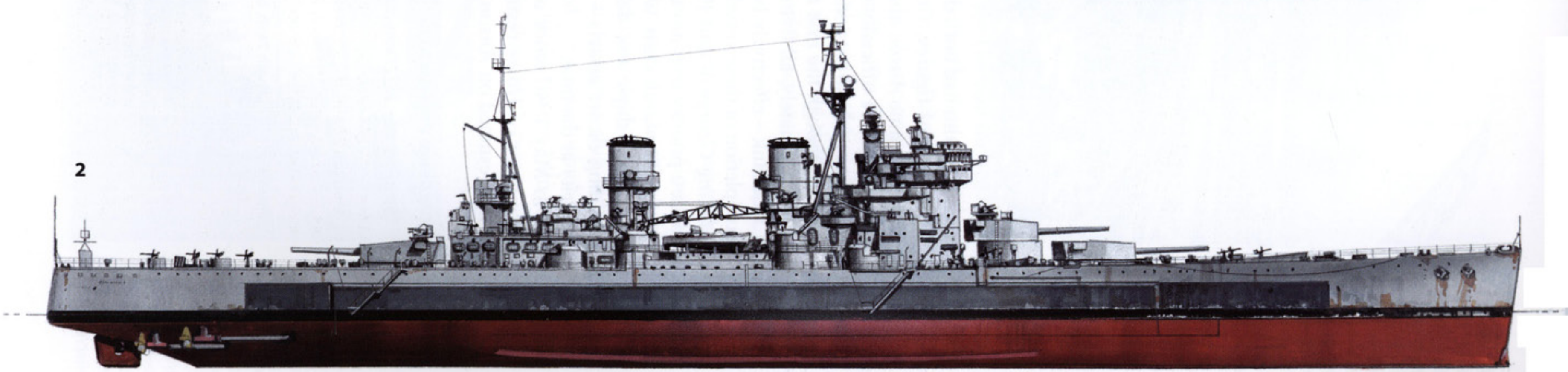
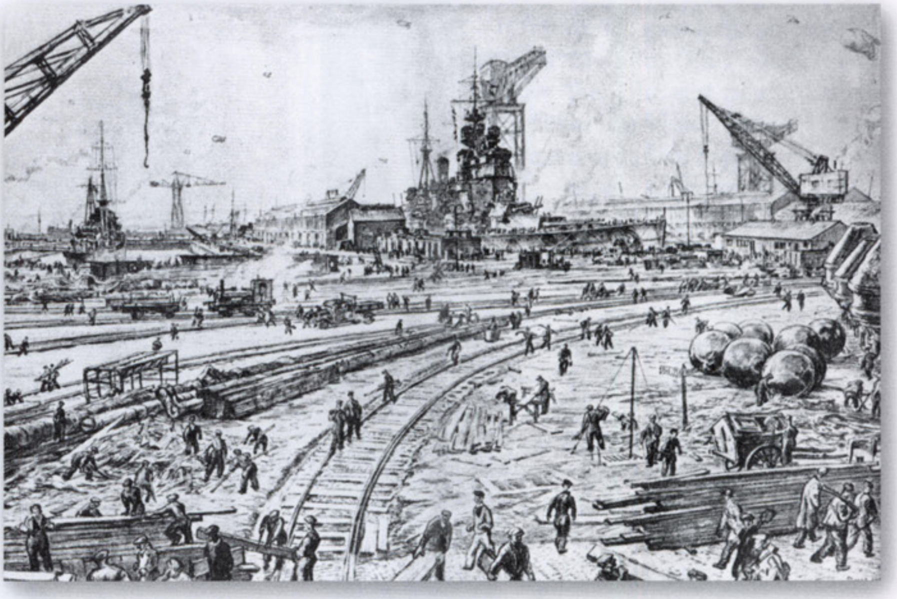


A sketch of HMS *King George V* undergoing final fitting out in Rosyth dockyard, on the Firth of Forth near Edinburgh, in late October 1940. The battleship went there immediately after commissioning to be fitted with radar, take on ammunition and stores, and conduct sea trials. She finally joined the Home Fleet at Scapa Flow in early December.

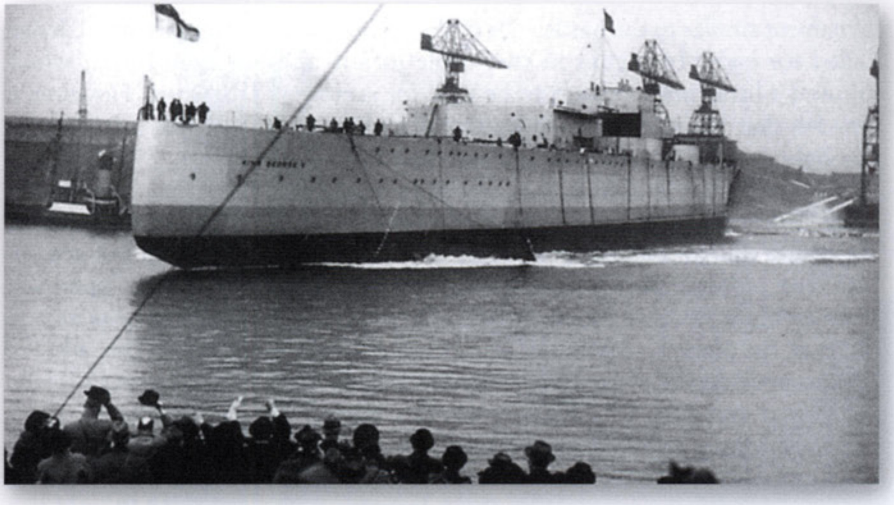


admirals who had both died only a year or so earlier, and who were somewhat controversial figures. Consequently, the ships originally called *Jellicoe* and *Beatty* became *Anson* and *Howe*, shortly before they were launched, at which time they were officially named.

None of these battleships was completed when the war began in September 1939, although the first two had at least been launched and were being fitted out. Fortunately, all five battleships were being built either on Tyneside or at Clydebank – effectively beyond the reach of German bombers. All that delayed completion of these vessels were the priorities set by the Admiralty. Completion of *King George V* and *Prince of Wales* went ahead as planned, in fact being made a priority after naval intelligence reported that the two German battleships of the *Bismarck* class were nearing completion. However, work on all the remaining ships was delayed when workers were temporarily diverted to building escort vessels – a project the Admiralty considered to be of higher priority at the time.

In May 1940 work on *Anson* and *Howe* was suspended completely. The fitting-out of *Howe* resumed two months later, but it was November before work resumed on *Anson*. The *Duke of York* entered service just weeks before

***King George V* class (as built)**			
Displacement	36,727 tons (standard)	Armament	10 x 14in Mk VII BL guns, in 2 quadruple turrets and 1 twin turret; 16 x 5.25in guns in 8 twin turrets; 4 x 8-barrelled 2-pdr pom-poms; 4 x 20-barrelled UP projectors
Dimensions	Length 745ft, beam 103ft, draft 29ft	Armour	Belt: 14–15in; bulkheads: 10–12in; barbettes: 13in; turrets: 12.75in (on front face); conning tower: 3–4in; decks: 5–6in
Propulsion	4 Parsons turbines, 8 Admiralty boilers, producing 110,000 steam horsepower. Maximum speed: 28½kt Fuel oil capacity: 3,770 tons	Complement	1,422 officers and men

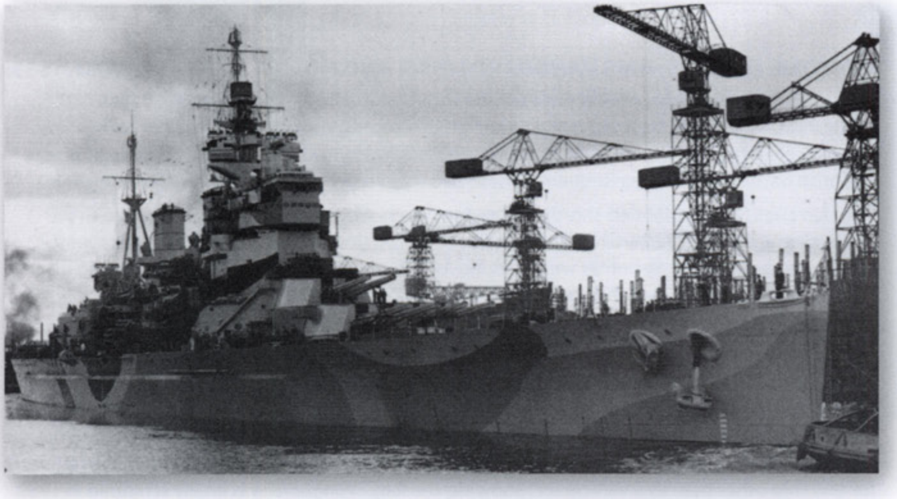


The launch of HMS *King George V* took place on 21 February 1939 at the Vickers-Armstrong shipyard, on the River Tyne in Newcastle. Given the length of the battleship this launch was a hazardous affair in such a relatively narrow river, but on the day everything went smoothly.

the *Prince of Wales* was lost off the coast of Malaya, so until 1942 only two modern battleships were in service; consequently, they were retained in home waters, where they could counter any moves made by the German surface fleet. It was not until the following summer that the final two battleships of the class were ready to join the fleet. However, by that time priorities had changed again, and these battleships were called upon to support the Arctic convoys, that important link which helped the Soviet Union during its own darkest hours. Consequently, these two vessels would spend much of the remainder of the war in the freezing waters of the Arctic, and it was there that one of them would demonstrate its effectiveness in one of the last great surface actions of the war.

The *Lion* class

The ships of the *King George V* class had barely been commissioned when the Admiralty asked the new Director of Naval Construction, Sir Stanley Goodall, to draw up plans for an even more powerful class of battleship. As there was now no apparent likelihood of resurrecting the naval treaties which had limited battleship size and gun calibre, Goodall was able to design a ship whose displacement slightly exceeded 35,000 tons. He opted for a vessel which was essentially a larger version of the *King George V* class. Instead of ten 14in guns in three turrets, he planned to mount nine 16in guns in three triple turrets – an



HMS *Howe* was built at Fairfield shipyard on Clydeside (Glasgow). This view shows the battleship in June 1942 being towed from the yard into the main channel of the River Clyde, during the final stages of fitting out. She finally entered service in late August.

armament similar to the battleships of the *Nelson* class. In fact, his initial design called for eight 16in guns in two triple turrets and one twin turret, which allowed a little more tonnage to be used for armoured protection. However, it was felt that production could be accelerated by using the same turret design throughout – the one already used in *Nelson* and *Rodney*.

The secondary armament comprised the same 5.25in DP guns used on the *King George V* class - 16 guns in eight twin turrets. The protection scheme for the earlier class of battleship was also copied, although the amount of armour was later reduced slightly to save weight. Fortunately for Goodall, Japan was keen to build ships of more than 40,000 tons, so eventually he was able to increase the planned displacement from 35,000 to 40,000 tons. This allowed him to provide the ships with adequate armour as well as a powerful main armament and high-performance engines. As noted, warship design was a matter of balancing this trinity – propulsion, armour and armament – and in the *Lion* class Goodall felt he had achieved something akin to perfection.

His design was approved by the Admiralty in December 1938, and two ships were duly commissioned – *Lion* and *Temeraire*. These vessels were laid down in July 1939, just two months before the outbreak of war. Two more *Lion* class battleships, *Conqueror* and *Thunderer*, were ordered in August, and work was scheduled to begin on them before the end of 1939. Then came the war. The Admiralty decided that given Britain's finite capacity for naval construction, the threat of German U-Boats meant priority had to be given building smaller vessels – destroyers and escorts. Consequently, on 3 October 1939 work was suspended on *Lion* and *Temeraire*, and the laying down of the remaining two battleships was suspended indefinitely. In late February 1940 the latter two ships were cancelled.

Lion and *Temeraire* remained on the stocks at the shipyards – Vickers-Armstrong on Tyneside and Cammell Laird in Clydebank – for most of the war. On several occasions it was proposed that construction on these vessels be renewed, but nothing came of these plans, and the two keels were finally broken up on the stocks in the summer of 1944. The *Lion* class remained the British battleships which never were – combining the firepower of the *Nelson* and *Rodney* with the speed, protection and elegance of the *King George V* class. Had production of these ships continued, they would probably have entered service in late 1942 or early 1943. One can only speculate on what effect these battleships would have had on the course of the naval war.

C

WARTIME DESIGNS: HMS *VANGUARD* (1946) AND HMS *LION* (AS PLANNED, 1939)

Arguably, these two ships should not really be included in a book about wartime British battleships, as one was built too late, and the other – representing a whole class of battleships – was cancelled before she was built. However, this book also traces the story of the development of British battleships, and consequently these two ships represent an important "missing link."

The *Lion* class (**1**) was planned shortly before the war, but by September 1939 only two ships of the class – *Lion* and *Temeraire* – had actually been laid down. In October construction was suspended as shipyard resources were needed for other work. *Lion* was eventually broken up on the slipway in 1944. Had they been built, these ships would have resembled the *King George V* class, but would have carried nine 16in guns mounted in three triple turrets.

In 1941 an order was placed for a new battleship – HMS *Vanguard* (**2**) – designed around the eight 15in guns left over when the old battlecruisers *Glorious* and *Courageous* were converted into aircraft carriers. This beautiful warship – the last British battleship – finally entered service in August 1946, a year after the war's end. She proved a highly successful design, but by then the age of the battleship had passed, and the Royal Navy found it increasingly difficult to find a use for this ship other than as a vehicle for "showing the flag." *Vanguard* was finally scrapped in 1960.

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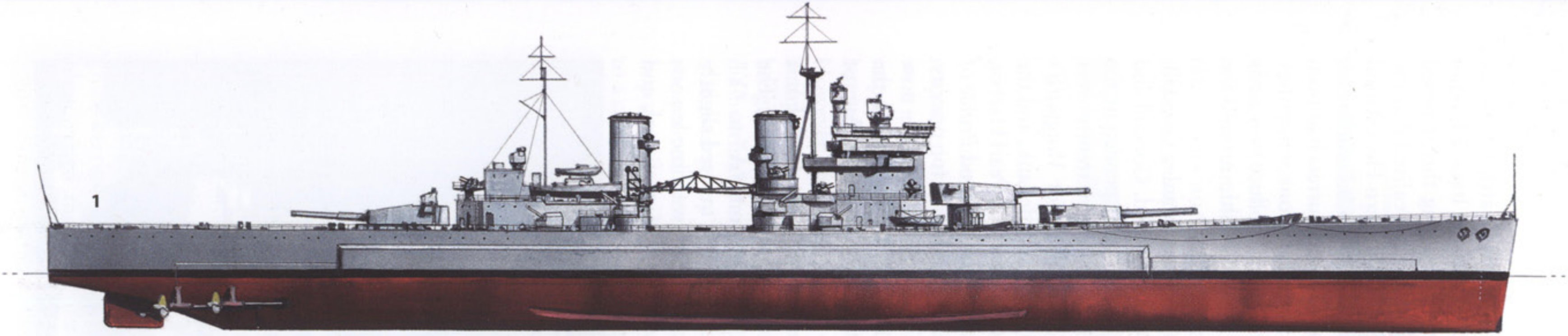

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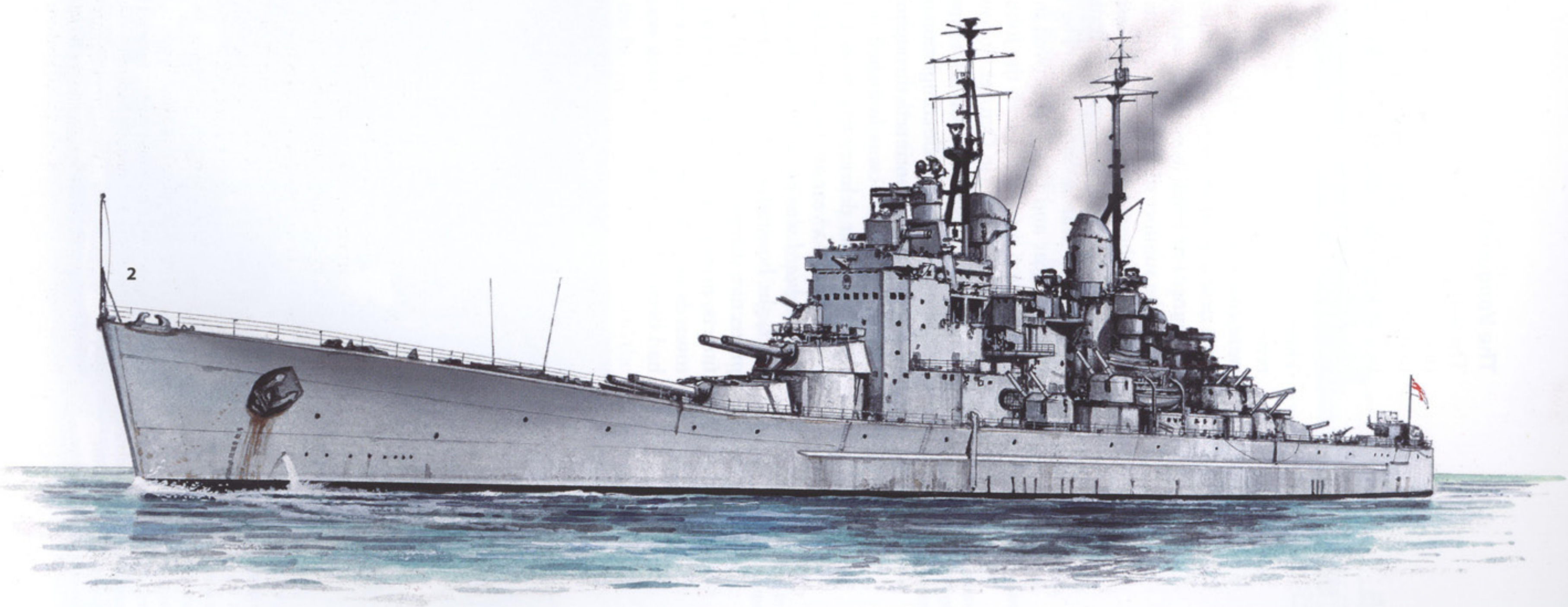


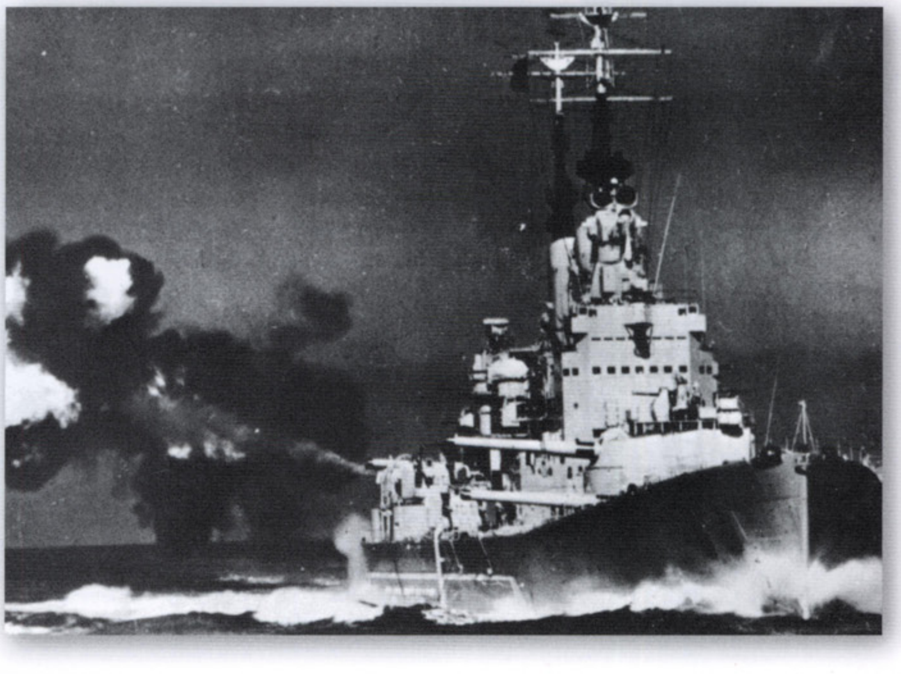
The *Vanguard*

The war also had strange consequences for another British battleship – one that would turn out to be the last in a line of ships stretching back a human lifetime. This battleship was designed to counter the growing threat posed by the Japanese in the Far East. By early 1939 the Admiralty realised that the rapid expansion of the Japanese navy meant the British Eastern Fleet would be heavily outnumbered in Far Eastern waters, so needed to be reinforced. Then someone remembered that in 1922, four twin 15in gun turrets had been removed from the old battlecruisers *Courageous* and *Glorious* when they were converted into aircraft carriers. As it took longer to produce new guns than new capital ships, it was decided to build a new battleship around the old guns. The result was *Vanguard*.

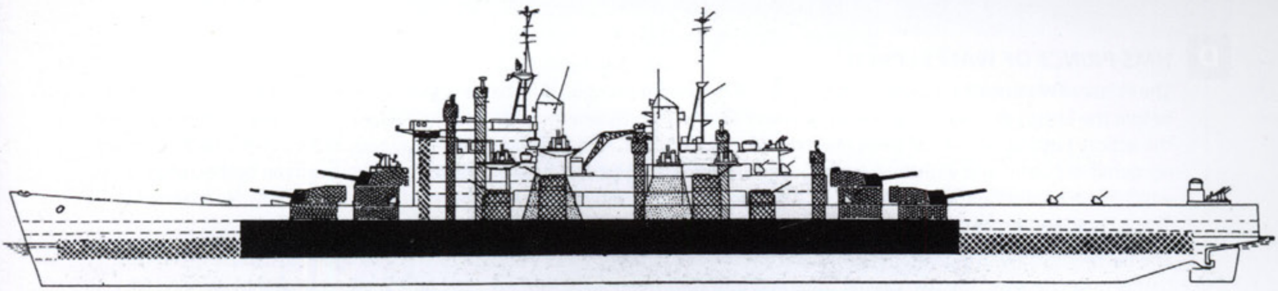
In the summer of 1939 three plans were drawn up by Sir Stanley Goodall, and one of these, for a 40,400-ton fast battleship, was approved. Goodall and his team began working on the details, but the project was suspended at the outbreak of war in September. The plans were revised intermittently over the next year and finally approved in April 1941. The order for *Vanguard*'s construction was placed with the John Brown shipyard in Clydebank, and the vessel was laid down in October. Following the Japanese attack on Pearl Harbor, Britain was plunged into war with Japan, and the loss of *Repulse* and *Prince of Wales* in December made completion of a replacement battleship a top priority.

Construction continued throughout the war. The new battleship – now named *Vanguard* – was launched in November 1944, but by that time the urgency for her delivery had passed, and she was finally completed in August 1946, almost a year after the Japanese surrender.

Vanguard was certainly unlike the pre-war battleships in the fleet. For a start, she boasted a long, flared bow, designed to improve seakeeping. The protective scheme involved a 14in armour belt stretching from "A" to "Y" turrets, protecting the magazines and engine spaces. The belt tapered slightly towards its ends and to just 4½in below the waterline. The wartime lessons had been learned: the ship's deck was armoured with up to 5in of steel, and



HMS *Vanguard*, firing her guns during an exercise off Malta in 1954. Despite her modern appearance, *Vanguard* was armed with left-over 15in guns rather than the most modern pieces of ordnance available. Consequently she lacked the firepower of the two earlier classes of British battleships.



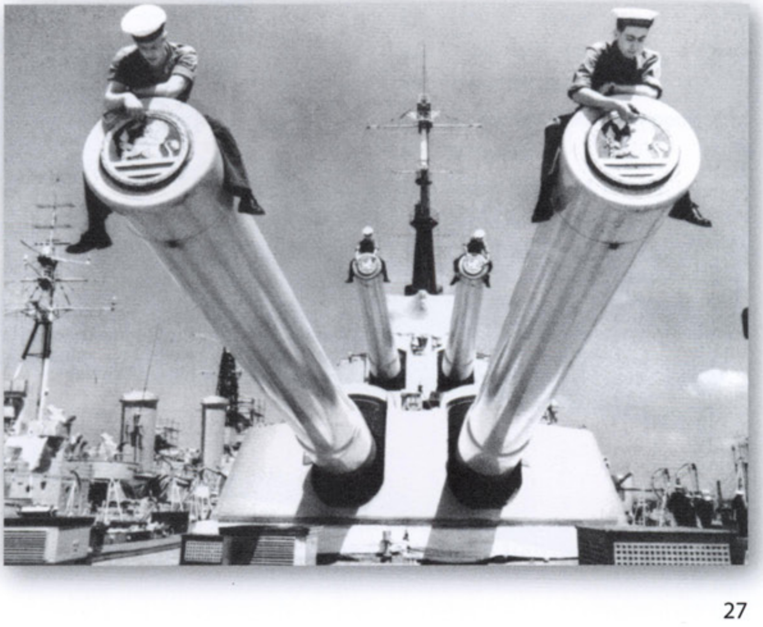
The armour protection of HMS *Vanguard* embraced many of the features first seen in the *King George V* class, with a main belt covering the magazines and engine spaces, and an additional splinter belt toward the bow and stern. This battleship had better underwater protection than previous battleships, and greater emphasis was given to maintaining the watertight integrity of the hull – drawing on lessons learned during World War II.

further protection was afforded by a 2½in-thick splinter deck. The propulsion system resembled that of the battleships of the *King George V* class, with four shafts and turbines and eight boilers producing 130,000shp and a respectable top speed of 30kt.

	Builder	Laid down	Launched	Completed	Fate
HMS *Vanguard*	John Brown, Clydebank	2 October 1941	30 November 1944	9 August 1946	Broken up 1960

Then there were *Vanguard*'s guns. The secondary armament of 5.25in guns resembled that of the *King George V* class, except that the twin gun mountings were improved. This, together with the improved radar fire-control systems and respectable array of light anti-aircraft guns meant *Vanguard* was the first British battleship to enter service with a realistic level of protection against air attack. However, the main guns – eight 15in Mk I pieces – were housed in four antiquated twin turrets. One historian likened it to a new battleship, but with her great-aunt's teeth. Compared with modern American battleships, *Vanguard*'s main armament was meagre and outdated. However, none of this really mattered as by the time *Vanguard* entered service the war was over, and she proved ideally suited to a new role of "showing the flag." Even more importantly, by 1946 it was clear that the era of the battleship had finally drawn to a close. As *Vanguard*'s predecessors in the British battlefleet were towed to the scrapyard, the new battleship remained the last of its kind, an imposing but obsolete reminder of past glory. Perhaps "*Rearguard*" might have been a more appropriate name.

HMS *Vanguard*'s forward 15in guns, photographed in 1960, just months before the battleship was broken up. Originally installed in HMS *Glorious* and HMS *Furious*, they were removed when the battlecruisers were converted into aircraft carriers during the 1920s.



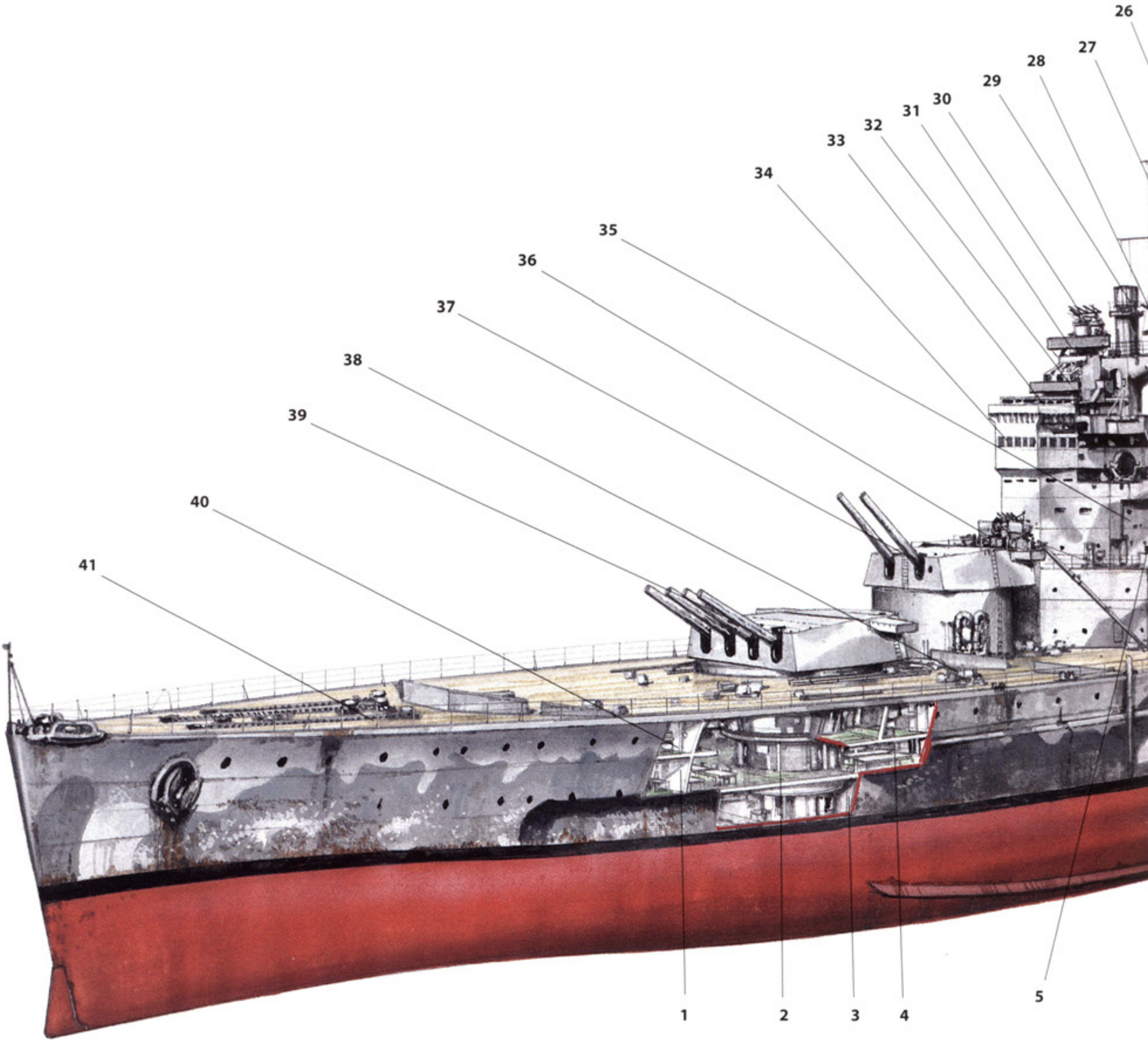
Armament

In contrast to some other navies, the Royal Navy tended to design its guns to be accurate and reliable rather than to perform well at extreme range. The shift from twin to three- or four-gun turrets inevitably created technical problems, most of which were overcome by the time these battleships were called upon to fire their guns in anger. The 15in Mk I guns carried on *Vanguard* were identical to the weapons carried on the older British battleships of

D HMS *PRINCE OF WALES* (1941)

The *Prince of Wales* had a momentous baptism of fire, being plunged into battle against the German battleship *Bismarck* before the British ship was fully operational and with civilian contractors still aboard. *Prince of Wales* was hit three times in the action, putting two of the three main turrets out of action. As the third turret was already defective the battleship was rendered impotent and withdrew from the fight, stopping only to pick up the three survivors from the battlecruiser *Hood*, which blew up during the action. After the damage was repaired and the defects dealt with, *Prince of Wales* returned to Scapa Flow, and on 25 October sailed from the Clyde, bound for the Far East.

The battleship arrived in Singapore on 2 December, and within a week was sent into action again, in company with the battlecruiser *Repulse*. The two capital ships and four destroyers were formed into Force Z, commanded by Admiral Sir Tom Phillips, who flew his flag in *Prince of Wales*. At 11.15am on 10 December 1941 the British force was attacked by more than 75 Japanese dive- and torpedo-bombers, which came in successive waves. At 11.40am *Prince of Wales* was hit in the stern by a single torpedo, which damaged the port propeller shafts and cut power to most of the heavy anti-aircraft guns. he *coup de grâce* came minutes later when she was hit by another four torpedoes. The stricken battleship finally rolled over and sank at 1.18pm, taking 327 of the crew with her.



SPECIFICATIONS: HMS *PRINCE OF WALES*. *King George V* class battleship (armament as carried in December 1941)

Displacement: Built: Cammell Laird Shipyard, Clydebank (Glasgow)

Laid Down: 1 January 1937

Launched: 3 May 1939

Commissioned: 31 March 1941

Length: 745ft overall (700ft on waterline)

Beam: 103ft

Draught: 29ft

Displacement: 36,727 tons (standard)

Propulsion: Steam boilers and turbines

Speed: 28½ knots

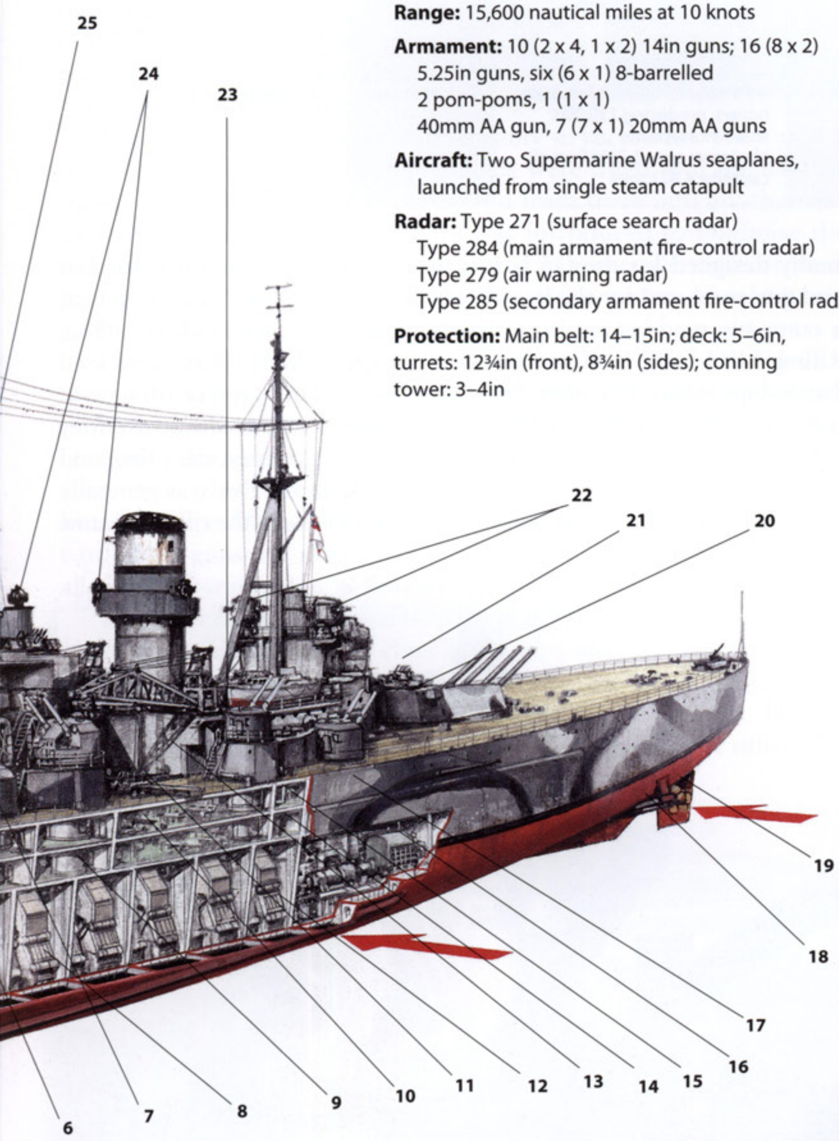
Range: 15,600 nautical miles at 10 knots

Armament: 10 (2 x 4, 1 x 2) 14in guns; 16 (8 x 2) 5.25in guns, six (6 x 1) 8-barrelled 2 pom-poms, 1 (1 x 1) 40mm AA gun, 7 (7 x 1) 20mm AA guns

Aircraft: Two Supermarine Walrus seaplanes, launched from single steam catapult

Radar: Type 271 (surface search radar)
Type 284 (main armament fire-control radar)
Type 279 (air warning radar)
Type 285 (secondary armament fire-control radar)

Protection: Main belt: 14–15in; deck: 5–6in, turrets: 12¾in (front), 8¾in (sides); conning tower: 3–4in



KEY

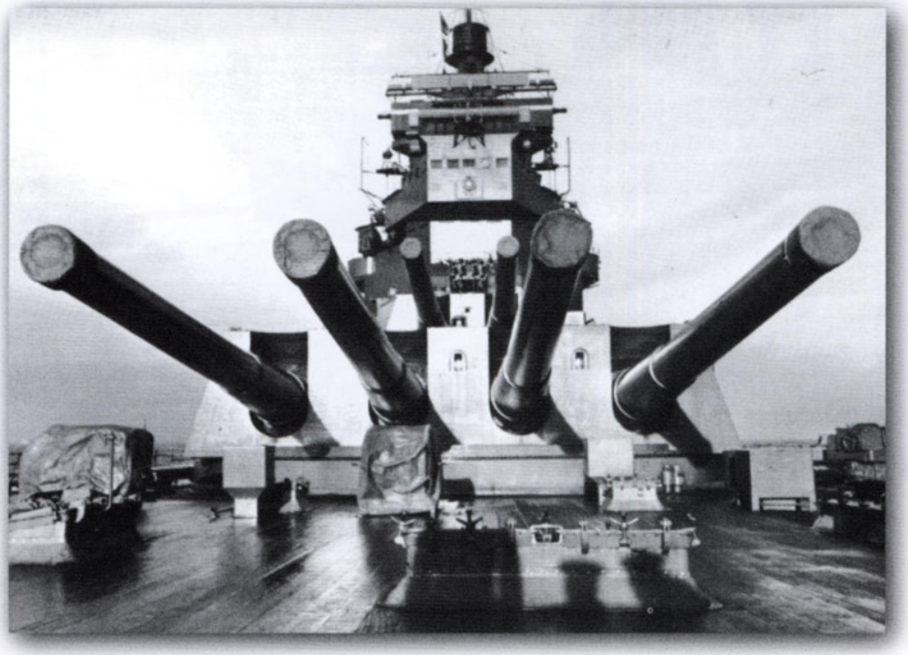
1. Stores
2. "A" Turret barbette
3. Meat Store
4. Seamen's Messdeck
5. Single 40mm mount
6. Stoker's Messdeck
7. Twin 5.25-inch turret
8. Forward Boiler Rooms
9. Royal Marines' Messdeck
10. Seamen's Messdeck
11. Catapult
12. After Boiler Rooms
13. Hangars
14. Ships Offices
15. Gunnery Office
16. Turbines
17. Wardroom
18. Inner and outer Propellers
19. Rudder
20. "X" Turret
21. 8-barrelled 2-pdr pom-pom
22. Secondary Director Towers
23. Boat Deck
24. Searchlights
25. Funnel
26. Type 279 Air Warning Radar
27. Foremast
28. Secondary Armament Director
29. Fire Control Top
30. Type 285 AA Radar
31. Type 284 Main Gunnery Radar
32. Main Director Tower
33. Admiral's Bridge
34. Captain's Bridge
35. Senior Officers' Quarters
36. 8-barrelled 2-pdr pom-pom
37. "B" Turret
38. Single 20mm AA mount
39. "A" Turret
40. Library
41. Forecastle

*The red arrows represent the Japanese aerial torpedo hits inflicted on the *Prince of Wales* on 10th December 1941

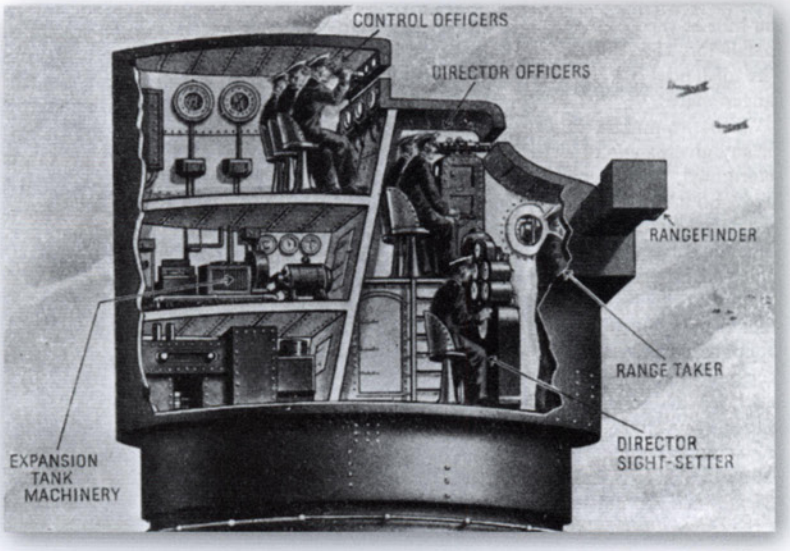
World War I vintage, described in Osprey New Vanguard 154: *British Battleships, 1939–45* (1). However, the 16in Mk I guns of the *Nelson* class and the 14in Mk VII pieces of the *King George V* class both represented new departures for the Admiralty.

Vanguard			
Displacement	44,500 tons (standard)	Armament	8 x 15in Mk I BL guns, in 4 twin turrets; 16 x 5.25in guns in 8 twin turrets; 10 x 6-barrelled, 1 x twin-barrelled and 11 x single 40mm Bofors guns; 4 x 3-pdr saluting guns
Dimensions	Length 760ft, beam 108ft, draft 30ft 10in	Armour	Belt: 4.5–14in; bulkheads: 4–12in; barbettes: 11–13in; turrets: 13in (on front face); conning tower: 1–3in; decks: 5in
Propulsion	4 Parsons turbines, 8 Admiralty boilers, producing 130,000 steam horsepower Maximum speed: 30kt Fuel oil capacity: 4,423 tons	Complement	1,893 officers and men

Originally designed for the G3 battlecruisers, the 16in Mk I was the last wire-bound gun produced for the Royal Navy, by Elswick and Vickers. In fact, the latter company made two versions with slightly different kinds of rifling, termed Rifling Mk I and Mk II. Sixteen-inch guns with Mk I rifling were used in both battleships when they were first built, but the later type of rifling was introduced into *Nelson* in May 1944, and partially introduced into *Rodney* between 1937 and 1942. This meant that in the case of *Rodney*, the rifling and therefore the accuracy of the guns varied slightly. However, this was generally not a problem as the differences were minimal, especially since the rifling became worn slightly with use.



The forward 14in guns of HMS *Duke of York*, pictured as the battleship lay at anchor in Scapa Flow in early 1943. These were the weapons that battered the German battlecruiser *Scharnhorst* into submission in December 1943.



The gunnery control position of a *Nelson* class battleship, as depicted in a wartime diagram. This fire-control team provided visual targeting information to the gunnery officer and the crews of the 16in guns. Later in the war this visual targeting system was augmented by radar-guided fire control.

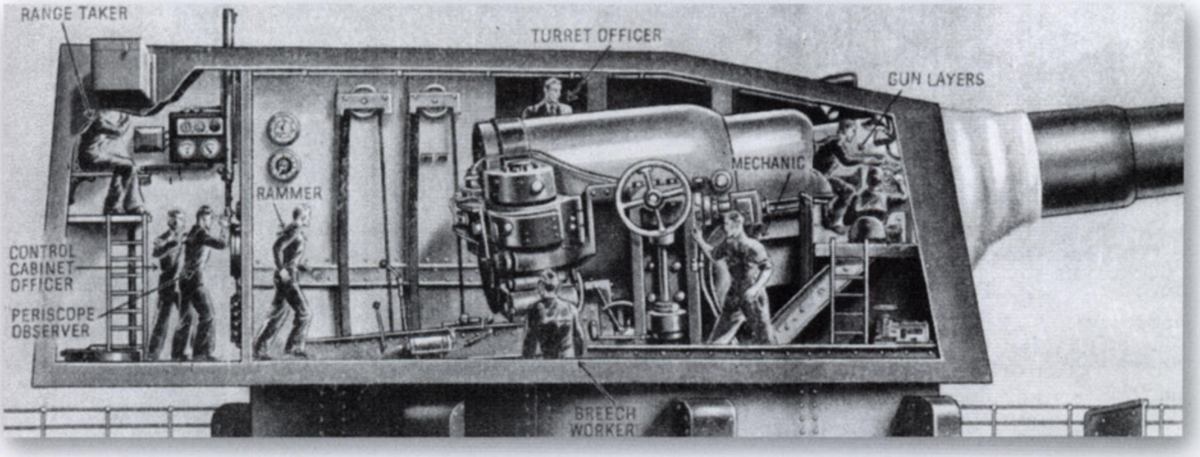
Accuracy remained a problem with these guns, particularly as it was found that salvos tended to spread out slightly during flight One solution was to fire incomplete salvos using every second gun – in effect firing two salvos of four and five guns each. However, the loading mechanisms operated simultaneously for all guns, inevitably reducing the rate of fire. At first the turrets also gave a lot of trouble, but several modifications during the 1930s ensured that by 1939 all 16in guns and turrets were considered both reliable and effective.

The 14in Mk VII guns were never quite so successful. They used a slightly more complex loading system. Charges were lifted into the handling room using flashproof mechanical cages, and from there into another set of hoist cages. A complex system of doors was introduced to minimise the risk of accidental detonation, but this also greatly increased the chances of something somewhere going wrong. In theory the whole system should have worked very well, in practice certain minor design flaws led to problems.

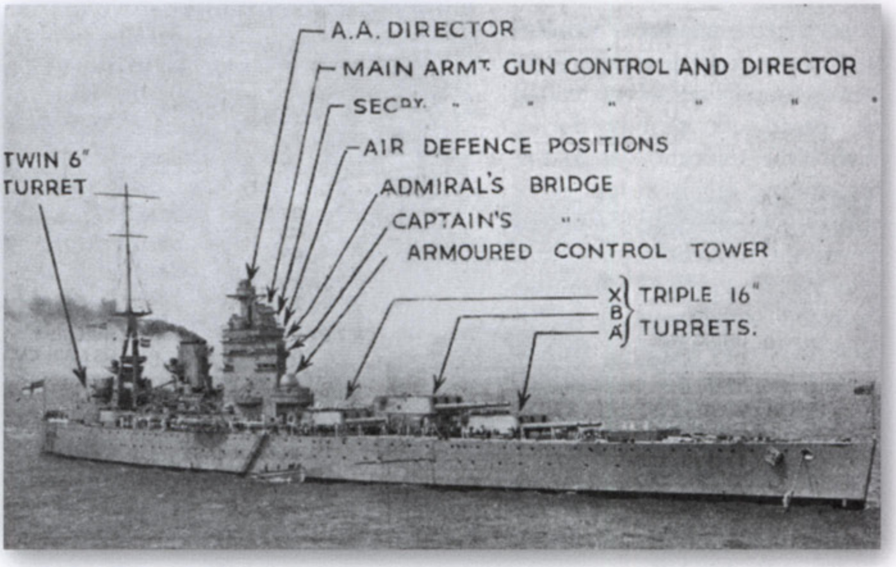
During her engagement with *Bismarck* in May 1941 the *Prince of Wales* attempted to fire 74 shells; of these, 19 failed to fire due to various technical problems with either the loading system or the shells themselves. These problems continued throughout the war. In December 1943, during her action against *Scharnhorst*, the *Duke of York* only managed to fire two-thirds of her full salvos, because of problems with the loading mechanisms. That said, the British battleship's guns still managed to pound the German battlecruiser into scrap, allowing *Scharnhorst* to be finished off with torpedoes.

The other important consideration was fire control. The main guns of the *Nelson* and *King George V* class battleships were designed to be fired using visual fire control. In the two earlier battleships, gunnery was controlled from a director control tower atop the forward superstructure. The later class had two smaller director control towers, one forward, the other aft. The big

The interior of a 16in gun turret on a *Nelson* class battleship, showing the positions of the turret crew during action. While gunnery information was passed to the turret officer by phone, the crew also retained the ability to direct their guns themselves in the event that all other forms of fire control were knocked out.



The gunnery control locations on HMS *Rodney* imposed onto a pre-war photograph for use in a wartime training manual. The anti-aircraft and main gun director positions were located high in the superstructure so as to provide the best all-round visibility and be clear of spray or smoke. However, the armoured control tower remained the nerve-centre of the ship during a gunnery engagement.



change during the war was the introduction of reliable radar fire control. This gave these battleships a significant advantage over their German or Italian counterparts, and as the war progressed these radar systems became increasingly accurate and reliable.

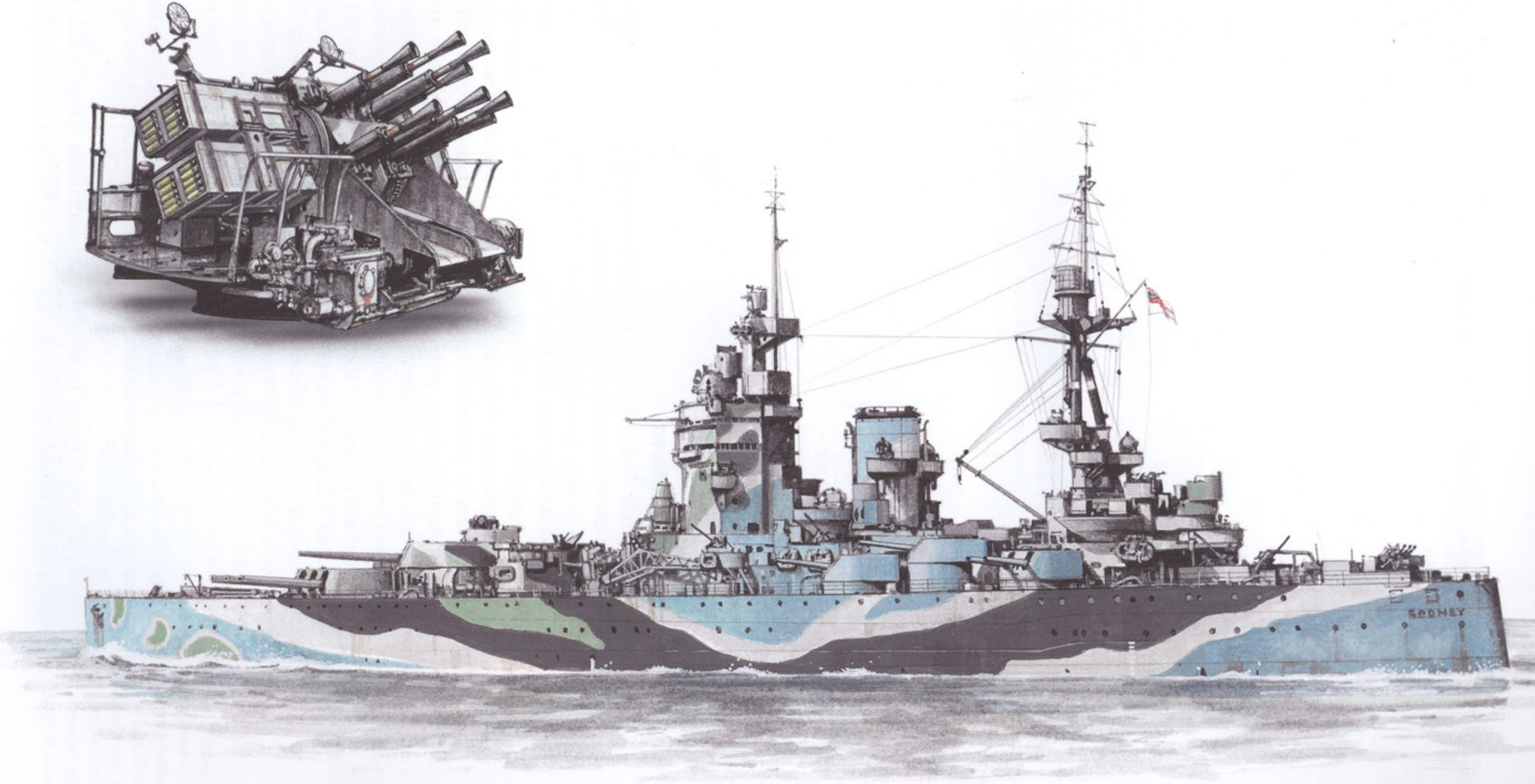
For example, in December 1943 the Type 284M fire-control radar on board the *Duke of York* was able to track *Scharnhorst* at a range of 43,000yd and direct gunfire at 26,000yd. During the battle the radar operators were even able to spot the fall of shot, and consequently operate without needing any visual targeting at all. In the dark, stormy conditions of the Barents Sea this made the *Duke of York* an extremely formidable fighting machine. A combination of well-designed guns, highly accurate fire control and experienced crew more than compensated for any problems involved in loading. By the time *Vanguard* entered service in 1946, these radar fire-control systems had become even more reliable, and *Vanguard's* 1948 refit made it one of the most technologically advanced surface gunnery platforms in the world. Unfortunately, by that time the need for a big-gun battleship had passed.

E

NELSON CLASS: HMS *RODNEY* (1943)

After *Rodney's* engagement with *Bismarck* in May 1941, the British battleship completed her planned refit in Boston, then spent much of the next two years in the Mediterranean. She returned to home waters in late 1943, and in June 1944 operated in support of the Normandy landings, spending the best part of six weeks firing at German shore installations and troop concentrations. Soldiers from 12 SS Panzer Division likened *Rodney's* shell to an approaching express train and described rounds as falling like Odin's hammer blows. Less satisfactorily, the 16in guns were also used to reduce Caen to rubble. An American pilot flying overhead during the bombardment described how buildings seemed to melt away from the battleship's fire.

During this period the greatest threat to *Rodney* was posed by German aircraft. The battleship's anti-aircraft defences had improved dramatically since 1939, and both her heavy anti-aircraft guns and her pom-poms were capable of being directed by radar fire control. The eight-barrelled 2-pdr (40mm) pom-poms on Mk V mounts were particularly effective. One of these mounts is shown here. By June 1944 *Rodney* carried four of these multi-barrelled mounts – two on each side of the funnel, one atop "B" turret, and one on the quarterdeck. Their fire was capable of being directed by Type 282 fire-control radar as well as more conventional visual means.


RODNEY

16in Breech Loader, Mk I

Calibre: 16in
Date of design: 1920
Date first in service: 1927
Length of bore: 45 calibres (720in)
Length of barrel: 742in
Weight of gun: 108 tons
Mounting: Triple Mk I
Maximum elevation: 40°
Rate of Fire: Two rounds per minute

Weight of shell: 2,048lb
Shell types: High explosive (limited quantities), armour-piercing
Weight of propellant charge: 495lb
Muzzle velocity: 2,614 feet per second

Maximum range: 39,780yd

Ammunition storage per gun: 80 rounds
Estimated barrel life before replacement: 250 rounds

14in Breech Loader, Mk VII

Calibre: 14in
Date of design: 1936
Date first in service: 1940
Length of bore: 45 calibres (630in)
Length of barrel: 651in
Weight of gun: 79 tons
Mounting: Twin Mk II and quadruple Mk III turrets
Maximum elevation: 41°
Rate of fire: Two rounds per minute

Weight of shell: 1,590lb
Shell types: High-explosive, armour-piercing
Weight of propellant charge: 339lb
Muzzle velocity: 2,483 feet per second

Maximum range: 38,560yd
Ammunition storage per gun: 120 rounds
Estimated barrel life before replacement: 375 rounds

Range and penetration (given for 16in armour-piercing shells)

Gun elevation (degrees)	Range (yards)	Strike velocity (feet per second)	Angle of descent (degrees)	Flight time (seconds)
2¼	5,000	2,248	2½	6
5	10,000	1,996	6	14
8½	15,000	1,778	10	22
12½	20,000	1,606	16½	31
17½	25,000	1,486	24	42
23¾	30,000	1,431	33	55
32½	35,000	1,453	43½	71
39¼	37,500	1,503	50	83

Range and penetration (given for 14in armour-piercing shells)

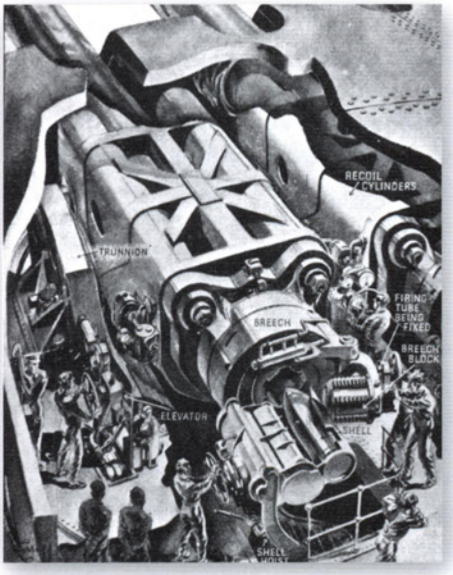
Gun elevation (degrees)	Range (yards)	Strike velocity (feet per second)	Angle of descent (degrees)	Flight time (seconds)
2½	5,000	2,160	3	7
5½	10,000	1,927	6½	14
9	15,000	1,726	11½	23
13¾	20,000	1,563	18	33
19¼	25,000	1,459	26½	44
26¼	30,000	1,432	35½	58
36	35,000	1,482	47	75
40¾	36,000	1,523	50½	58

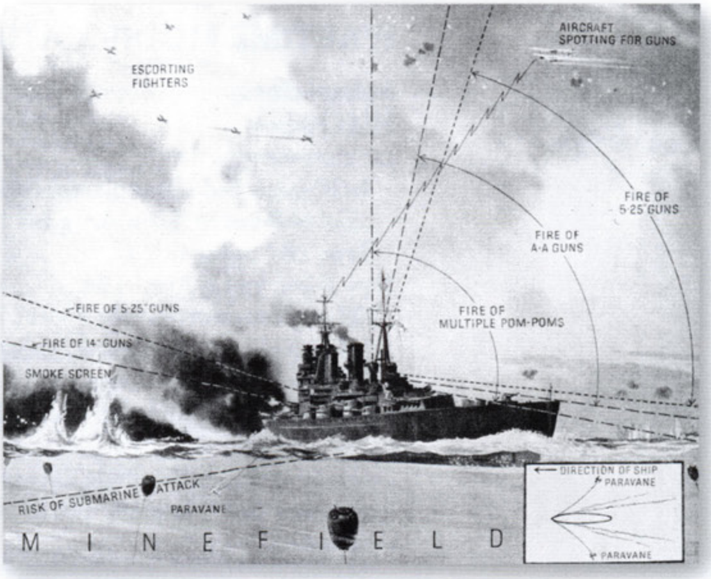
Service Modifications

All of these eight battleships were modified slightly over the years, although none underwent the extensive refits accorded to the old 15in battleships in the fleet. As soon as they were commissioned, the ships of the *King George V* class were plunged straight into the fray, so never received anything more than the usual wartime modifications reflecting the introduction of new technology and weapons. The two capital ships of the *Nelson* class entered service in 1927, so enjoyed 12 years of peacetime service before the outbreak of World War II.

Pre-war modifications were minor. In 1930 both *Nelson* and *Rodney* received a High-Angle Control System (HACS) to help direct anti-aircraft fire, while *Nelson's* bridge was modified by enclosing the compass platform. By 1935 plans were made to improve these ships' armour and replace the 6in guns with more versatile 5.25in DP weapons. Due to financial constraints none of these modifications ever took place. However, in 1937–38 an extra 3in of deck armour were added to the forward deck of *Nelson*, and the platform deck was reinforced by 4in of steel plating. The only other real improvement was to replace the single-barrelled 2-pdrs. With two eight-barrelled 2-pdr pom-poms, one on each side of the funnel. Even these were introduced one at a time, over five years. *Rodney* also received a third eight-barrelled pom-pom, mounted on the quarterdeck. At the same time the submerged torpedo tubes were disabled but not removed.

While plans were made to incorporate aircraft handling facilities, the only battleship of the class to receive an aircraft was *Rodney*, when in 1935 a flying-


RECOIL CYLINDERS
TRUNNION
FIRING TUBE BEING FIXED
BREECH
BREECH BLOCK
ELEVATOR
SHELL
SHELL


ESCORTING FIGHTERS
AIRCRAFT SPOTTING FOR GUNS
FIRE OF 5·25" GUNS
FIRE OF A-A GUNS
FIRE OF MULTIPLE POM-POMS
FIRE OF 5·25" GUNS
FIRE OF 14" GUNS
SMOKE SCREEN
RISK OF SUBMARINE ATTACK
PARAVANE
MINEFIELD
DIRECTION OF SHIP
PARAVANE
PARAVANE

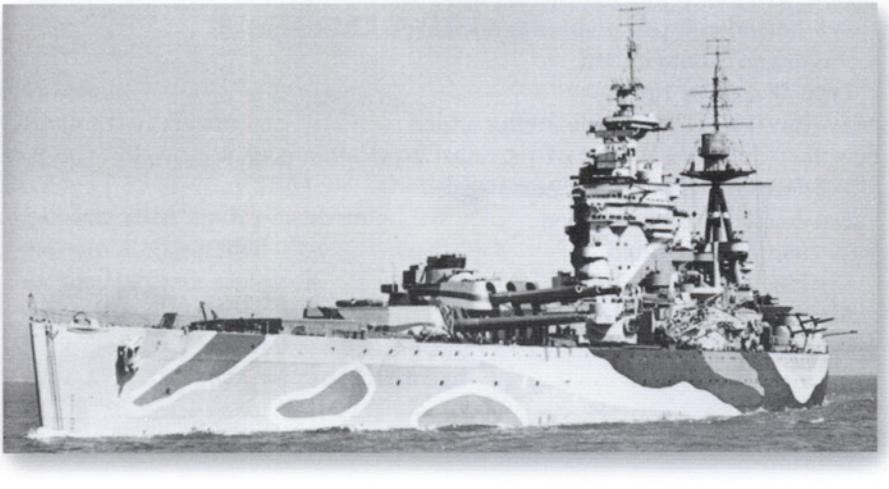
The *Nelson* class battleships at the outbreak of World War II

***Nelson* class (c.1939)**

Displacement	33,313 tons (*Nelson*), 33,730 tons (*Rodney*) (standard)	Armament	9 x 16in Mk I BL guns, in 3 triple turrets; 12 x 6in guns in 6 twin turrets; 6 x 4.7in anti-aircraft guns in single mounts; 2 x 8-barrelled 2-pdr pom-poms (three such mounts on *Rodney*); 4 x 3-pdr saluting guns in single mounts
Dimensions	Length 710ft, beam 106ft, draft 28ft 1in	Armour	Belt: 13–14in; bulkheads: 4–12in; barbettes: 12–15in; turrets: 16in (on front face); conning tower: 14in; decks: 3.75–6.5in (3.75–9.5in in *Nelson*) *Rodney*: 1 Walrus seaplane (mounted on "X" turret)
Propulsion	2 Brown & Curtis turbines, 8 Admiralty boilers, producing 45,000 steam horsepower Maximum speed: 23k Fuel oil capacity: 3,800 tons	Complement	1,314 officers and men

ABOVE LEFT
A diagram showing the interior of a triple 16in turret of a Nelson class battleship, showing the gun crews at work. The shells and cordite propellant were delivered to the three breeches using shell hoists, and loading was carried out mechanically.

ABOVE RIGHT
A wartime diagram showing the offensive and defensive arcs of fire of a King George V class battleship. On the right are the defensive anti-aircraft arcs of fire, on the right is the angle of trajectory of the main and secondary armament, while beneath the ship is the angle at which a torpedo attack was considered most likely.



HMS *Rodney*, photographed on the River Clyde in May 1942, shortly before she sailed for the Far East. She had just emerged from a refit, during which her anti-aircraft armament was increased slightly and a new array of radars was fitted.

WARTIME MODIFICATIONS

***Nelson* class**

HMS Nelson

January–August 1940: 3×8-barrelled 2-pdr pom-poms added
4×20-barrelled UP projectors added
Shields fitted to 4.7in AA guns
Type 281 radar fitted
September 1941–April 1942: 13×single 20mm added
UP projectors removed
1×8 barrelled 2-pdr pom-pom added
Torpedo tubes deactivated
Type 273, 283, 284 and 285 radars fitted

October 1943: 28× single 20mm added
September 1944–January 1945: 4× quad 40mm added (boat deck and bridge)
24× single 20mm added

HMS Rodney

August 1940: 2× single 20mm added (to "B" turret)
Type 279 radar fitted
June–September 1941: 3×8-barrelled 2-pdr pom-poms added
Type 271, 281, and 284 radar added
April 1942: Type 272, 282, 283 and 285 radar fitted
17× single 20mm added
October 1942: 2× single 20mm added
May 1943: Aircraft facilities removed
35× single 20mm and 5× twin 20mm added
Shields fitted to 4.7in AA guns
July 1944: 2× single 20mm added
Type 650 (missile-jamming) radar fitted

***King George V* class**

HMS King George V

Completed with Type 279 and 284 radar fitted.
October 1941: UP projectors removed
1×4-barrelled 2-pdr pom-pom added (on "Y" turret)
1×8-barrelled 2-pdr pom-pom added (on "B" turret)
18× single 20mm added
Type 282 radar fitted
May–July 1943: 20× single 20mm added
February–July 1944: 1×4-barrelled 2-pdr pom-pom removed
3×8-barrelled 2-pdr pom-poms added
2×4-barrelled 40mm added
6× twin 20mm added
12× single 20mm removed
Aircraft facilities removed
Type 277, 279B, 281B and 293 radar fitted

HMS Prince of Wales

Completed with 1× single 40mm in lieu of one UP projector
Type 284, 279 and 285 radar also fitted before commissioning
July 1941: UP projectors removed
  2×8-barrelled 2-pdr pom-pom added
  Type 271 radar added
December 1941: 7× single 20mm added

HMS Duke of York

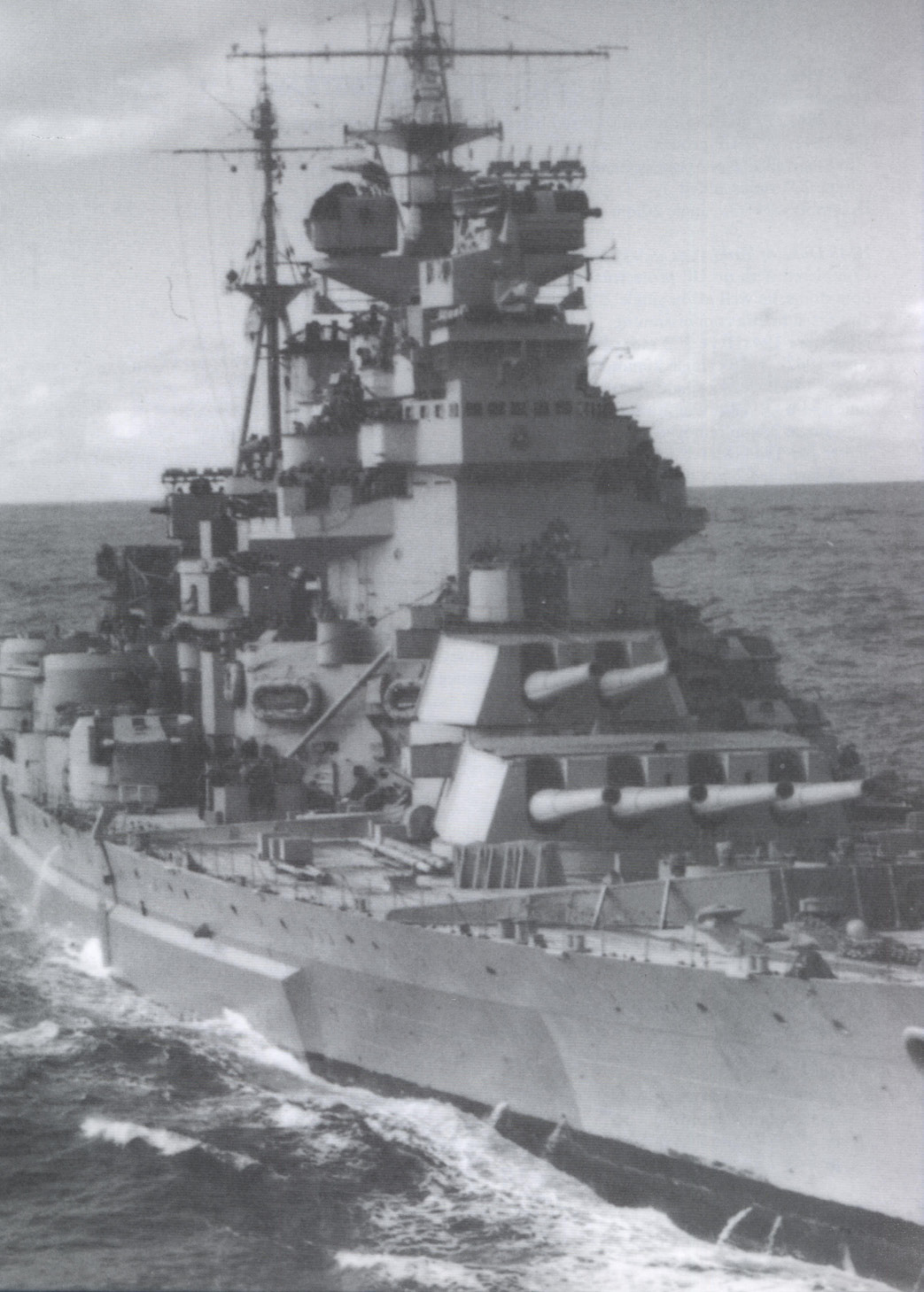
Completed with no UP projectors, and 6 rather than 4×8-barrelled 2-pdr pom-poms, as well as 6× single 20mm. Type 281, 282, 284 and 285 radar also fitted before commissioning.
November 1941: Type 273 radar fitted
April 1942: 8× single 20mm added
March 1943: 24× single 20mm added
June 1944: 2× twin 20mm added
  8× single 20mm removed
September 1944–March 1945: 2×4-barrelled 40mm added
  2×8-barrelled 2-pdr pom-pom added
  6×4-barrelled 2-pdr pom-pom added
  14× twin 20mm added
  18× single 20mm removed
  Aircraft facilities removed
  Type 274 radar added

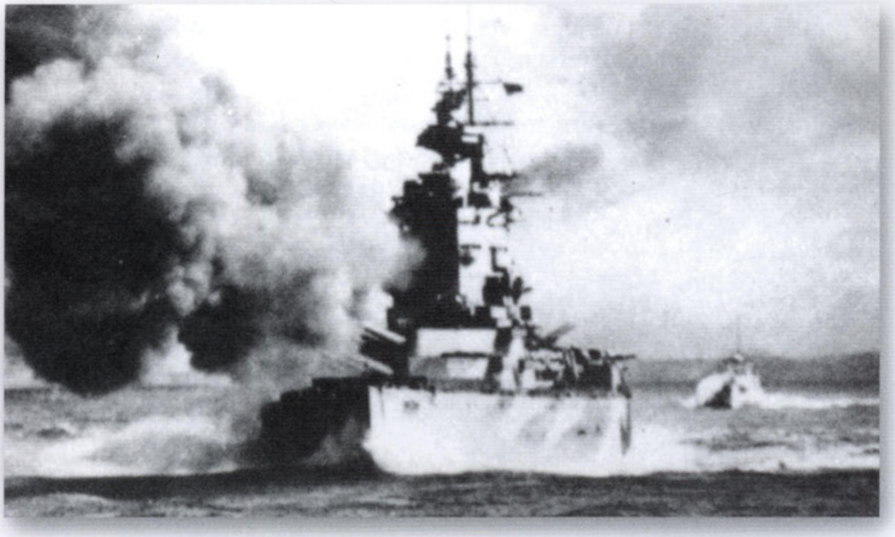
HMS Anson

Completed as *Duke of York*, only with 12 additional single 20mm, and an additional Type 271 radar fitted before commissioning.
March 1943: 18× single 20mm added
July 1944–March 1945: 2×4-barrelled 40mm added
  2×8-barrelled 2-pdr pom-pom added
  4×4-barrelled 2-pdr pom-pom added
  8× twin 20mm added
  13× single 20mm added
May 1945: 2×4-barrelled 2-pdr pom-pom added.
  2× twin 20mm removed
  Aircraft facilities removed
  Type 262, 271, 275, 277, 281B and 291 radar added
  Type 274, 281, 282, 284 and 285 radar removed

HMS Howe

Completed as *Anson*
March 1943: 22× single 20mm added
December 1943–May 1944: 2×4-barrelled 40mm added
  2×8-barrelled 2-pdr pom-pom added
  4× twin 20mm added
  6× single 20mm removed
  Aircraft facilities removed
  Type 274, 282 and 283 radar added
  Type 273, 281 and 284 radar removed





LEFT
HMS *Nelson* firing her main guns at maximum elevation. The photograph was probably taken during Operation *Husky* – the Allied invasion of Sicily in July 1943. She performed a similar role during subsequent landings in Calabria and Normandy.

OPPOSITE
HMS *Duke of York* in the Far East in August 1945. By the end of the war she was fitted with an impressive array of air-search, surface-search and fire-control radars, the most prominent of which were mounted atop of the main and secondary gunnery direction towers.

off platform for a Fairey Swordfish floatplane was mounted atop "X" turret. This aircraft was replaced by a Supermarine Walrus seaplane in 1938. That same year the battleship also received a prototype Type 79Y air-warning radar, the first to be fitted to any British battleship. Despite this, when World War II began the two battleships of the *Nelson* class were largely unmodified.

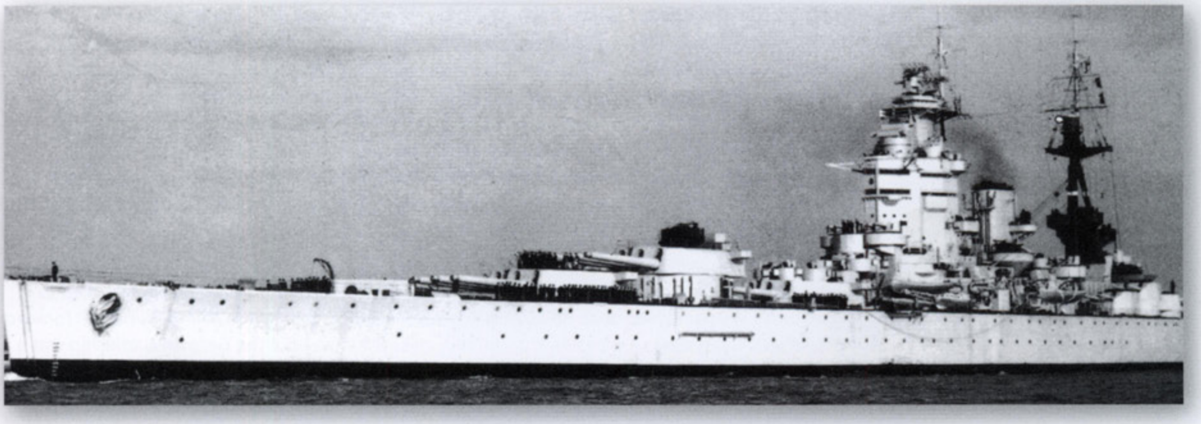
SERVICE HISTORY

Nelson class

HMS *Nelson*

Throughout the pre-war years, *Nelson* served as the flagship of the Home Fleet (known as the Atlantic Fleet before 1932). When the war began she was involved in the pursuit of German raiders, but in December 1939 the ship struck a mine off Loch Ewe in western Scotland, which damaged the forecastle and caused heavy flooding. After being repaired in Portsmouth *Nelson* rejoined the Home Fleet in August 1940, where she resumed the task of countering German sorties into the Atlantic. In April 1941 the battleship escorted a convoy around Africa to Egypt, and was then transferred to Force H, based in Gibraltar.

On 8 August *Nelson* was hit by an Italian aerial torpedo off Sardinia, which detonated in the same place as the magnetic mine had almost two years earlier. The ship was repaired in Malta and Rosyth, and in May 1942 she returned to



HMS *Nelson*, pictured in late 1946 while serving as the training ship for the Home Fleet. She continued to function as a training vessel until the following October, when she was placed in reserve, before being turned into a bombing target. (MoD)

Gibraltar, taking part in Operation *Pedestal*, where she escorted a vital resupply convoy to Malta. The battleship remained with Force H until October 1943, and her guns were used to support the landings in Sicily and Calabria. By June 1944 the vessel was off Normandy, and spent a week firing at German positions in support of the Allied invasion. Then on 18 June *Nelson* struck another mine; this time she was towed to Philadelphia for repairs.

The ship returned to service in January 1945, and after a retraining period with the Home Fleet was sent to the Far East, joining the Eastern Fleet in July. After receiving the surrender of Japanese forces in Singapore *Nelson* returned home, where she was placed on the reserve list. After a brief spell as a training ship the vessel was earmarked for disposal, and in 1948 suffered the final indignity of being used as a bombing target for the Fleet Air Arm. *Nelson* was finally taken to the breaker's yard in early 1949.

HMS *Rodney*

Like her sister ship, *Rodney* spent her pre-war years in home waters. In September 1939 she unsuccessfully hunted *Scharnhorst* and *Gneisenau*, then underwent minor repairs until December. In April 1940 she took part in the Norwegian Campaign, where she was hit by a German bomb which failed to cause any serious damage. For the next year the battleship operated in support of Atlantic convoys, but in May 1941 was called from her duties to pursue *Bismarck*. On 27 May *Rodney* and *King George V* caught up with the German battleship and pounded her into a floating wreck, at which point the *Bismarck* was finished off with torpedoes. During the action *Rodney* scored more than 40 hits with her 16in guns.

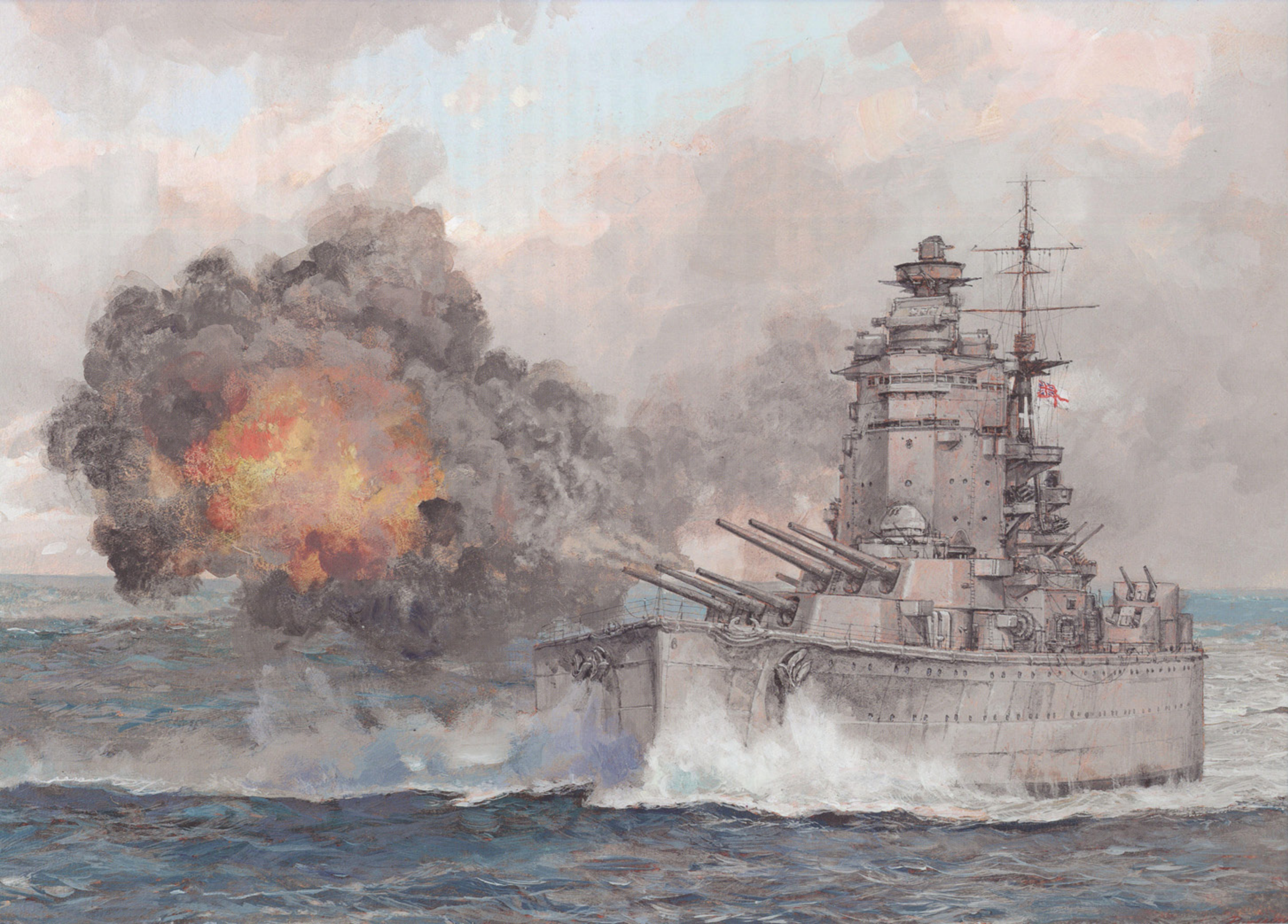
Damage from the British battleship's own guns had caused damage to her superstructure, so *Rodney* sailed for repairs in Boston. She returned to service later that summer, and by September was operating in support of the Malta convoys. She rejoined the Home Fleet in November 1941, and operated in support of convoys or in countering German sorties until August 1942, when she returned to the Mediterranean. After taking part in Operation *Pedestal* she supported the landings in North Africa that November, then went to Scapa Flow for training before returning to Gibraltar in June 1942. *Rodney* fired her guns in support of the landings in Sicily and Calabria that summer, and in September performed the same naval gunfire support role off the Salerno beachhead.

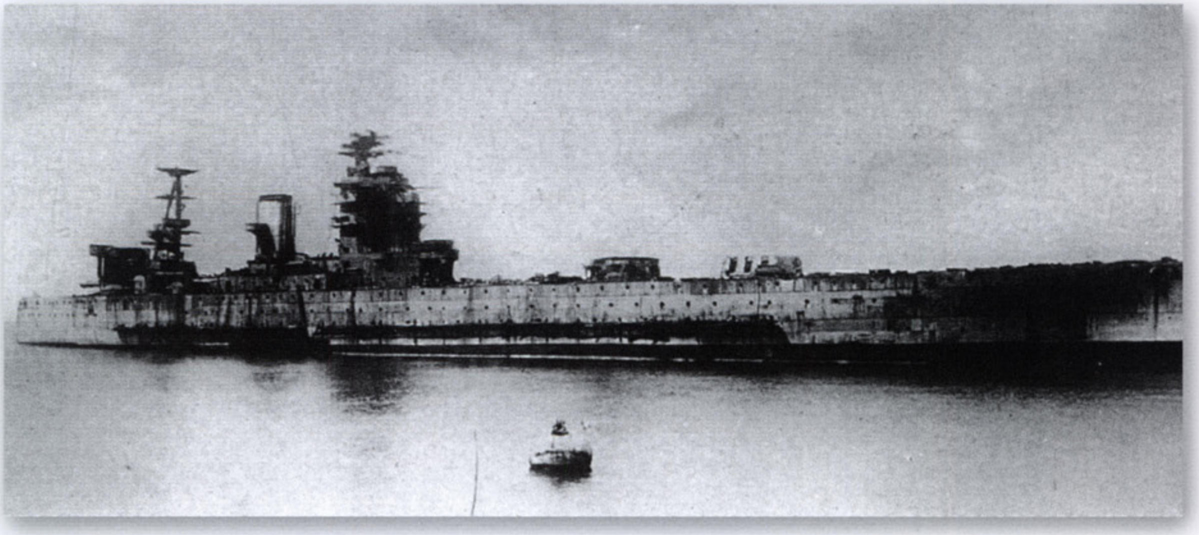
F

HMS *RODNEY* ENGAGING THE *BISMARCK*, 27 MAY 1941

In May 1941 HMS *Rodney* was serving with the Home Fleet, based in Scapa Flow. When the German battleship *Bismarck* began her sortie into the Atlantic, *Rodney* was escorting the troopship RMS *Britannic*, which had just sailed from the Clyde bound for Canada. After the loss of HMS *Hood* on 24 May, Admiral Frederick Dalrymple-Hamilton – commanding *Rodney* – was ordered to take command of three escorting destroyers and sail to intercept *Bismarck*. *Rodney* was in poor repair and could only make 22 knots, while the decks were packed with crates for use during a planned refit in Boston. Fortunately *Bismarck* was damaged during an attack by Swordfish torpedo-bombers, and *Rodney* was able to overhaul her opponent on 27 May. By that stage *Rodney* had been joined by other warships of the Home Fleet, including HMS *King George V*, commanded by Admiral Sir John Tovey.

At 8.47am *Rodney* opened fire at a range of 25,000yd, and *Bismarck* returned fire, straddling *Rodney* on the third salvo. Dalrymple-Hamilton manoeuvred to avoid being hit, swinging to starboard to allow all three 16in turrets to bear. At 9.02am *Rodney* scored her first hit, disabling *Bismarck's* forward turrets. What followed was remorseless pounding, and within an hour the German battleship was a blazing wreck. She was finally finished off with torpedoes. This view of the engagement shows the situation at 9am – the moment when the fourth German salvo straddled *Rodney*.





A sad end: HMS *Nelson* with her guns removed, photographed in January 1949 while waiting to be broken up. Having spent the previous summer as a bombing target, the ship was completely derelict by the time she was towed to the breaker's yard in March 1949.

The vessel returned to home waters in October 1943, and remained there until the end of the war. In June she fired her guns in support of the D-Day landings, and in August engaged German batteries on Alderney. By November the ship was practically worn out, with her engines in poor repair. She became a static flagship in Scapa Flow, and in November 1948 was placed on the reserve list. The vessel was finally sold for scrap in March 1948.

King George V class

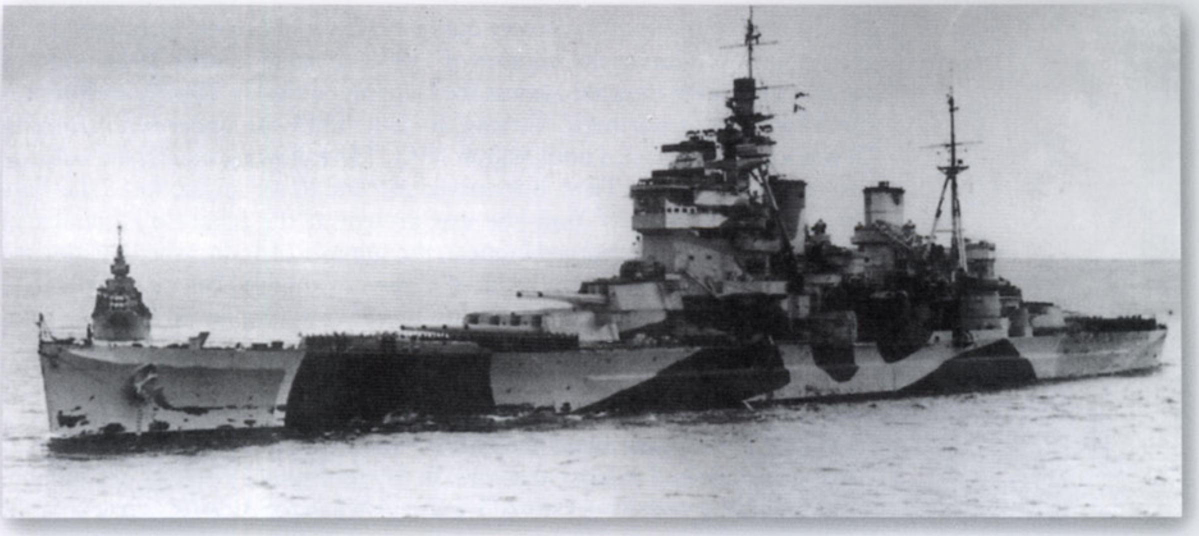
HMS *King George V*

The battleship entered service with the Home Fleet in December 1940, and remained in home waters for the next 2½ years. During this period she was involved in the pursuit and destruction of the *Bismarck* in May 1941, in the hunt for other German raiders, and in operations in support of the Arctic convoys. In May 1942 she accidentally rammed and sank the destroyer HMS *Punjabi* in thick fog. Repairs to the battleship lasted for most of that summer.

In May 1943 *King George V* was sent to join Force H, and took part in the invasion of Sicily, bombarding shore targets by way of a diversion. In September she escorted the surrendered Italian fleet to Malta, then rejoined the Home Fleet a few weeks later. She underwent a refit from February to July 1944, and in October sailed to Ceylon to join the newly-created British Pacific Fleet (formerly the Eastern Fleet). She assumed the role of flagship, and in February 1945 joined in the bombardment of Okinawa. In August she even bombarded the Japanese mainland near Tokyo, in the process becoming the last British battleship to fire her guns in anger. The vessel was present at the Japanese surrender on 2 September, but only returned to Britain the following year after undergoing a refit in Sydney. In May 1948 she became a training ship, and she was finally placed in reserve the following year. The battleship remained in reserve in the Gairloch until 1957, when she was sent to the breaker's yard.

HMS *Prince of Wales*

This battleship was damaged as she was being fitted out, and she only joined the Home Fleet in May 1941. Even then two of her turrets were still not fully operational, and so she sailed in pursuit of *Bismarck* with civilian contractors still aboard. On 24 May she and the *Hood* engaged *Bismarck* in the Denmark Straits, during which time *Prince of Wales* was hit three times, damaging



A battered HMS Anson, photographed after returning to Scapa Flow from a convoy escort operation in June 1942. Later that year she provided distant cover for convoy PQ 18 and attempted to intercept and destroy the German pocket battleship Lützow. She spent almost all her wartime career in northern waters.

"A" and "Y" turrets. *Prince of Wales* broke off the engagement after the sinking of *Hood*, as a combination of damage and defects meant she was in no condition to continue the fight. She was repaired at Rosyth and rejoined the Home Fleet in July. After carrying British Prime Minister Winston Churchill to meet US President Franklin D. Roosevelt, she was sent to the Far East in company with the battlecruiser *Repulse*. The ships arrived in Singapore five days before the attack on Pearl Harbor. On 8 December they were formed into Force Z and sent to intercept a Japanese amphibious force of Malaya. Two days later they were attacked by Japanese aircraft, and *Prince of Wales* was hit by five torpedoes. After 90 minutes she rolled over and sank. *Repulse* also succumbed to Japanese torpedoes. Both wrecks are now designated war graves.

HMS *Duke of York*

Duke of York entered service with the Home Fleet in November 1941, just two weeks before the loss of *Prince of Wales*. For the next year she provided cover for the Arctic convoys, including the ill-fated convoy PQ17. In October the vessel was sent to Gibraltar as the new flagship of Force H, and supported in the North African landings the following month. She rejoined the Home Fleet in December, after a brief refit at Rosyth, and became the fleet flagship in May 1943, flying the flag of Admiral Fraser. She returned to support duties with the Arctic convoys and on 26 December 1943 cornered and destroyed the German battlecruiser *Scharnhorst*, in the night-time engagement known as the Battle of North Cape. During the battle she fired 446 rounds from her main guns and scored more than 40 hits.

Duke of York remained in home waters until undergoing a refit in September 1944, which was only completed the following March. She was sent to join the British Pacific fleet, but although she saw no further action, she was present at the Japanese surrender in Tokyo Bay in September 1945. The ship returned to Britain the following year and in April 1949 was placed in reserve. She served as flagship of the reserve fleet until 1951, when she was laid up awaiting disposal. She was finally scrapped in 1958.

HMS *Anson*

Like the rest of her class, *Anson* first saw service in the Home Fleet, which she joined in the summer of 1942. She provided cover for the Arctic convoys but saw no action. In between convoy duties she covered carrier operations in the Norwegian Sea, during the summer of 1943 and again in early 1944. Most of the airstrikes were directed against the German battleship *Tirpitz*, anchored in the Altenfjørd in northern Norway. In June 1945 she underwent a refit in Devonport, which lasted until March 1945. The following month she sailed to join the British Pacific Fleet, but arrived too late to see any action. Like *King George V* and *Duke of York* she was present at the Japanese surrender in September 1945. She returned home in the summer of 1946, when she became a training ship. She was briefly placed in reserve in 1949, before being laid up the following year. She was broken up in 1957, having never fired her main guns in anger during her entire career.

HMS *Howe*

In August 1942 *Howe* joined the Home Fleet, and during early 1943 provided cover for Arctic and Atlantic convoys. In May she joined Force H in Gibraltar, and in company with *King George V* participated in the Allied invasion of Sicily, bombarding shore targets by way of a diversion. Following the surrender of the Italian fleet, Howe escorted this to Malta, then remained in the Mediterranean until October 1943, when she sailed for home. After a four-month refit she sailed for the Far East, joining the British Eastern Fleet in August 1944. She covered carrier operations in the East Indies, and in December became flagship of the newly-formed British Pacific Fleet. She operated in support of American carrier operations until May, when she was sent to Durban for a refit. She returned home in January 1946 and joined the Training Squadron. Between 1948 and 1949 she underwent a refit, and was then placed in reserve. The ship was finally disposed of in 1957.

HMS *Vanguard*

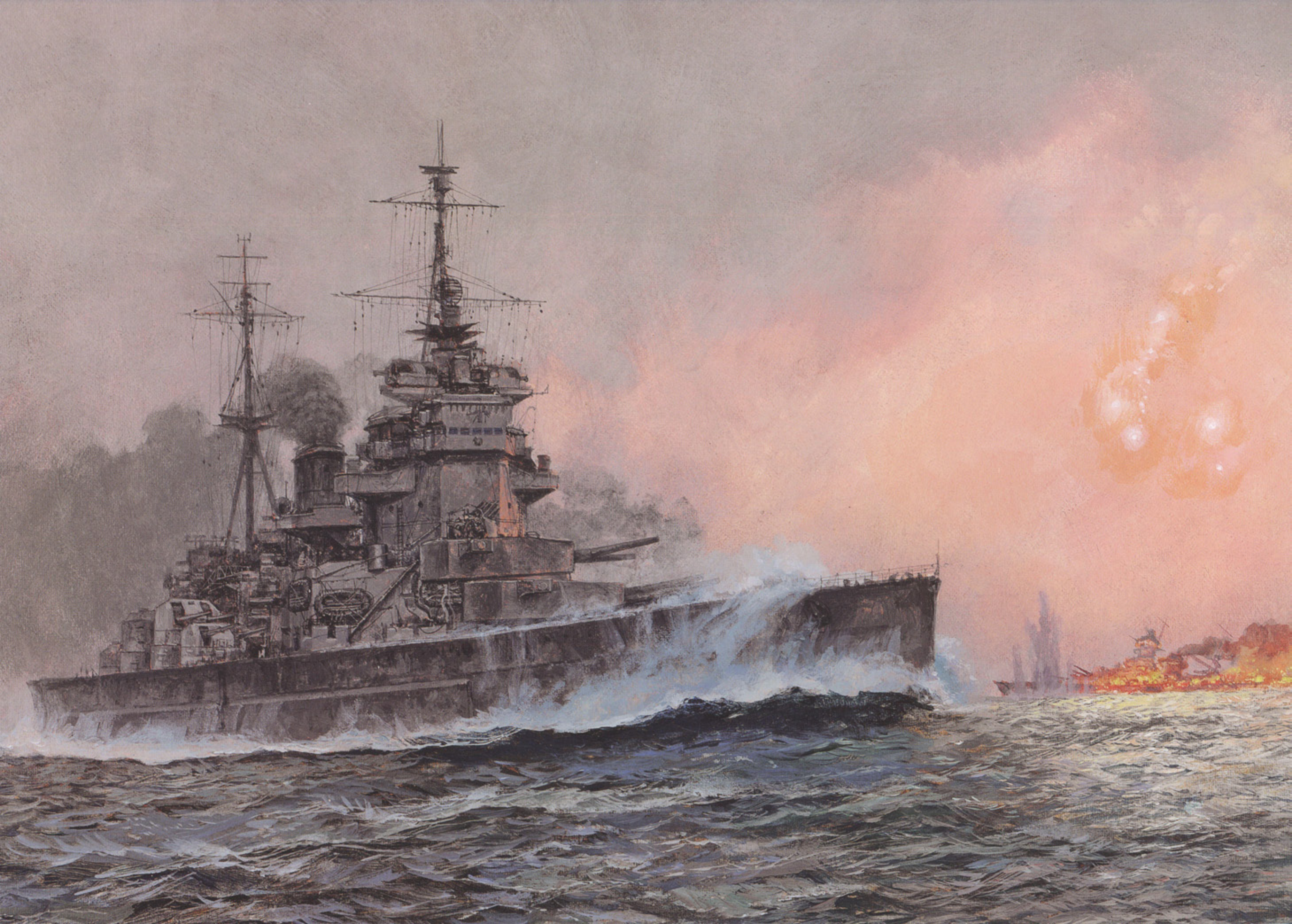
HMS *Vanguard* was only commissioned in August 1946, so she became the only British battleship since 1906 never to have participated in a war. For most of her career she served with the Home Fleet. In 1957 she took the Royal family on a cruise to South Africa, and in 1949 she took part in exercises in the Mediterranean. In 1951–54 she served as flagship of the Home Fleet, and participated in joint NATO exercises. In 1954 she was placed in reserve, and despite plans to convert her into a guided-missile ship, she remained in mothballs in Devonport until 1960, when she was scrapped.

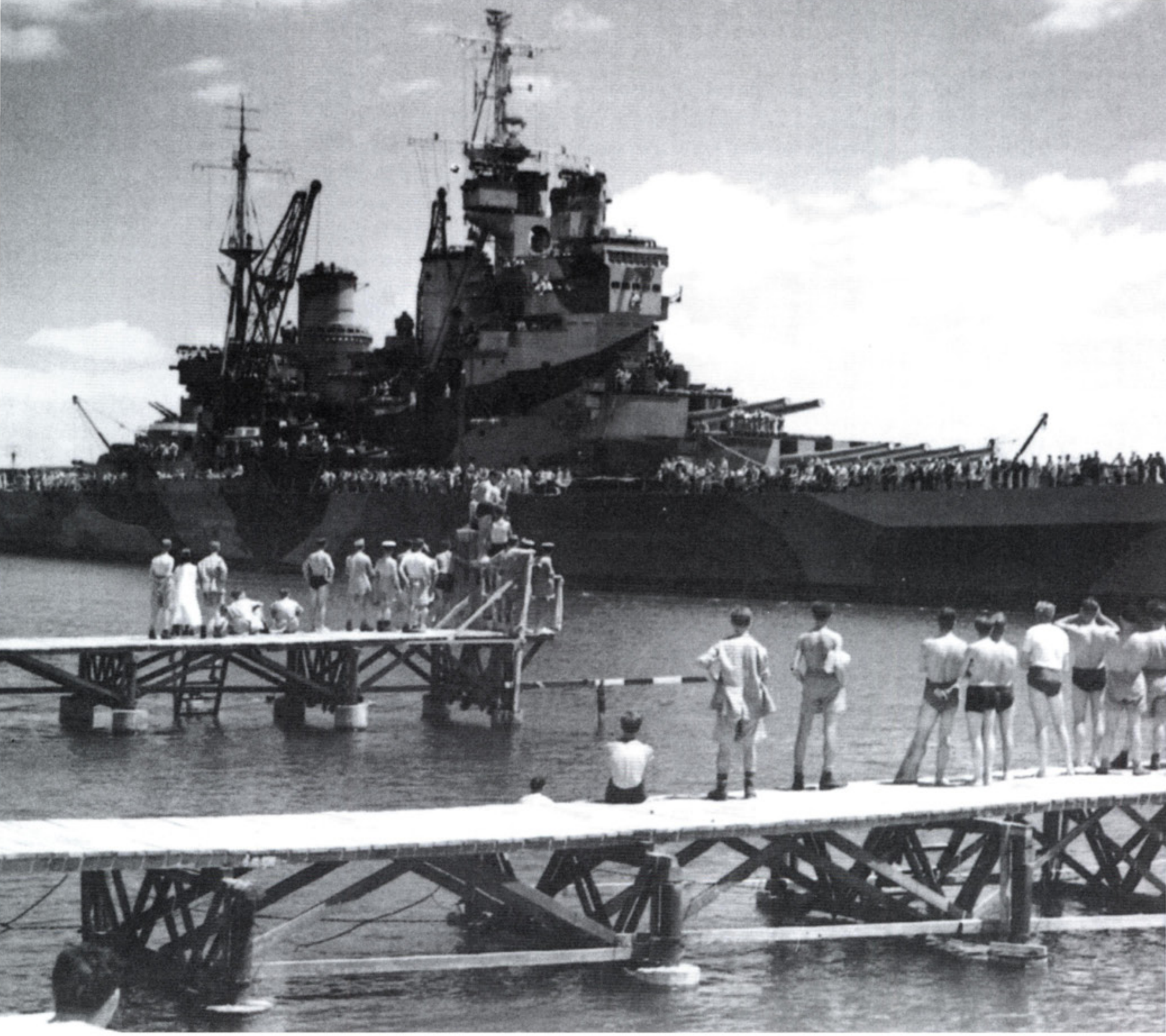
G

HMS *DUKE OF YORK* ENGAGING *SCHARNHORST*, DECEMBER 1943

In December 1943 HMS *Duke of York* flew the flag of Admiral Bruce Fraser, commander of the Home Fleet. Fraser used an Arctic convoy to tempt the German battlecruiser *Scharnhorst* into making a sortie, then on 26 December he trapped his prey between the battleship and a force of German cruisers. In the engagement – known as the Battle of North Cape – the *Duke of York* fought a running battle with *Scharnhorst* until a lucky hit at extreme range damaged the German vessel's engines. As destroyers moved in for the kill the British battleship closed to within 1½ miles (3,000yd), firing as she approached.

Within an hour of scoring that lucky hit the *Duke of York*'s 14in guns of had reduced the German battlecruiser to scrap. However, due to the trajectory they were unable to sink *Scharnhorst*, so the job of finishing off the German vessel was left to the destroyers. This scene shows the action during its final stages, around 7.15pm. During the 2½-hour engagement the *Duke of York* fired more than 80 salvoes, and scored numerous hits. However, as in previous actions involving battleships of the King George V class, mechanical problems meant that at times the volume of fire was significantly reduced, as barrels or occasionally whole turrets suffered from temporary breakdowns and defects.





HMS *Howe*, passing through the Suez Canal in July 1944, on her way from Britain to the Far East, with sailors and off-duty soldiers enjoying the spectacle. The camouflage scheme had already been adapted to conform to the pattern favoured by the Eastern Fleet.

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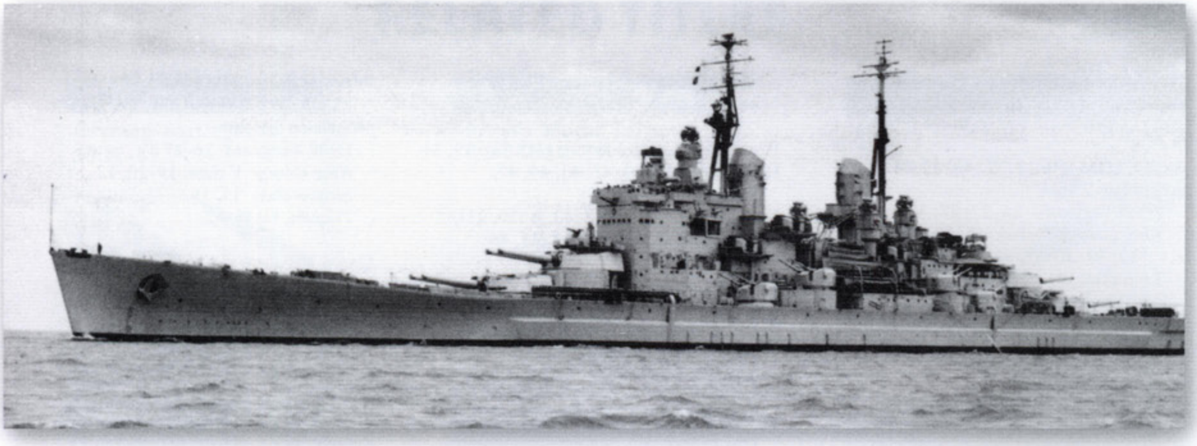

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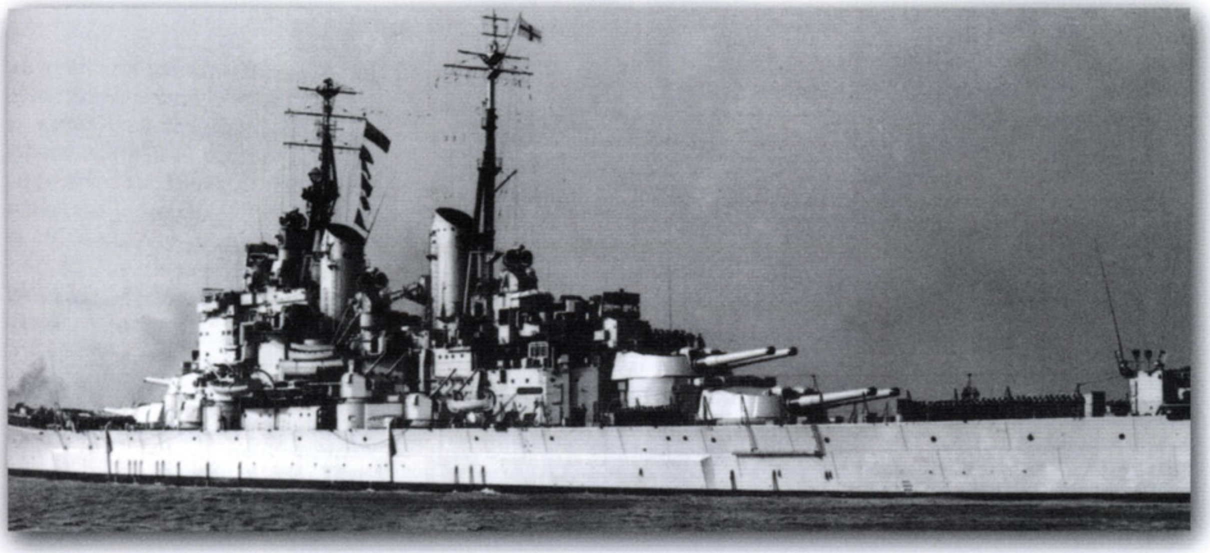
HMS *Vanguard* entering Portsmouth harbour in September 1950, after her summer cruise, which involved both naval exercises and "showing the flag." At the time she was flagship of the Home Fleet, and was regarded more as a command vessel than a fighting warship.

HMS *Vanguard*, pictured in the early summer of 1953, while once again serving as flagship of the Home Fleet. The previous year she had taken part in Operation *Mainbrace*, the first naval exercise conducted under the aegis of NATO. The exercise highlighted British reluctance to place Royal Navy units under the operational control of an American admiral, and American reluctance to give the British control of their own carrier fleet.



INDEX

Figures in **bold** refer to illustrations.
Plate caption locators in brackets.

Anson, HMS 20–22, 37, **43,** 43–44
armament 27–34
  HMS *Vanguard* **26,** 27, **27,** 32
  King George V class 18, **18, 19,** 22, **30,** 30–32, 34, **35, B** (20, 21)
  Lion class 24
  Nelson class 10, **10,** 12, 16, 30, **31,** 31–32, **32,** 34, **39, A** (12, 13), **E** (32, 33)
armour
  HMS *Vanguard* 26, **27**
  King George V class 19, 22
  Nelson class 11, 16, **E** (32, 33)

Benbow, HMS 16
Bismarck **7,** 8, **8, 16,** 17, 31, 40, 42–43, **B** (20, 21), **F** (40, 41)
Britannic, RMS **F** (40, 41)
British Eastern Fleet 44, **46**
British Pacific Fleet 42, 43, 44

Calabira landings (1943) 40
Cammell Laird shipyard 24
camouflage
  King George V class **46**
  Nelson class **10, 11**
Churchill, Prime Minister Winston 43
convoys 39, 40, 42, **43,** 43, 44
Courageous, HMS 26

D-Day landings (1944) 40, 42, **E** (32, 33)
Dalrymple-Hamilton, Admiral Frederick **F** (40, 41)
Deutschland class 17
Duke of York, HMS **19,** 20, **20,** 22–23, **30,** 31, 32, 37, **39,** 43, **G** (44, 45)
Dunkerque class 17

Eastern Fleet 44, **46**
Emperor of India, HMS 16

Fairey Swordfish floatplanes 39
Fairfield shipyard **23**
Force H 39, 40, 42, 43, 44
Force Z 43
France
  cost of war 5
  shipbuilding programme 17
  strength of the Navy 5, 7, 9
Fraser, Admiral Sir Bruce 43, **G** (44, 45)
Furious, HMS **27**

Germany
  shipbuilding programme 8, 17
  strength of the Navy 9
Gibraltar 39, 40, 43, 44
Glorious, HMS 26, **27**
Gneisenau 40
Goodall, Sir Stanley 23, 24, 26
Great Britain
  British Eastern Fleet 44, **46**
  British Pacific Fleet 42, 43, 44
  cost of war 5
  Force H 39, 40, 42, 43, 44
  Force Z 43
  Home Fleet 39, 40, 42, 43, 44, **47, F** (40, 41), **G** (44, 45)
  shipbuilding programme 17–18
  strength of the Navy 7, 8, 9

High-Angle Control System (HACS) **19,** 34
Home Fleet 39, 40, 42, 43, 44, **47, F** (40, 41), **G** (44, 45)
Hood, HMS 10, 11, 42, 43, **B** (20, 21),
Howe, HMS 20–22, **23,** 37, 44, **46**

Iron Duke class 16–17
Italy
  cost of war 5
  shipbuilding programme 17
  strength of the Navy 5, 7, 8, 9

Japan
  cost of war 5
  strength of the Navy 5, 6, 7, 8, 9
  surrender of 42, 43, 44
John Brown shipyard 26
Johns, Sir Arthur 17, 18

King George V, HMS **7, 17,** 20, 22, **22, 23,** 36, 42, **B** (20, 21)
King George V class 9, 16–23, **18**
  armament 18, **18, 19,** 22, **30,** 30–32, 34, **35, B** (20, 21)
  armour 19, 22
  camouflage **46**
  propulsion system 19–20, 22
  service history 42–44
  service modifications 34, 36–37
  turrets 18, 31, **D** (28, 29)

Lion, HMS 24, **C** (24, 25)
Lion class 23–25
Littorio 8
London Naval Treaty (1930) 8, 9, 16
London Naval Treaty (1936) 17, 20

Malta 40, 42, 44
Marlborough, HMS 16

NATO exercises 44, **47**
Nelson, HMS **6,** 8, 9, 30, 34, 36, **39,** 39–40, **42, A** (12, 13)
Nelson class 4, 7–8, **10,** 10–16, 35
  armament 10, **10,** 12, 16, 30, **31,** 31–32, **32,** 34, **39, A** (12, 13), **E** (32, 33)
  armour 11, 16, **E** (32, 33)
  camouflage **10, 11**
  propulsion system 15, 16
  service history 39–42
  service modifications 34, 36, 39
  turrets 11, **31, 35**
  North Africa, landings in (1942) 40, 43
  North Cape, Battle of (1943) 43, **G** (44, 45)
  Norwegian Campaign (1939) 40

Okinawa, bombardment of 42
Operation *Husky* (1943) **39**
Operation *Mainbrace* (1952) **47**
Operation *Pedestal* (1942) 40

Pacific Fleet 42, 43, 44
Pearl Harbour, attack on 43
Phillips, Admiral Sir Tom **D** (28, 29)
PQ17 convoy 43
Prince of Wales, HMS **8, 19,** 20, 22, 23, 26, 37, 42–43, **D** (28, 29)
propulsion system
  HMS *Vanguard* 26–27
  King George V class 19–20, 22
  Nelson class 15, 16
  Punjabi, HMS 42

Queen Elizabeth class 7, 17

radar **35, 39**
  Type 79Y air-warning radar 39
  Type 282 fire-control radar **E** (32, 33)
  Type 284M fire-control radar 32
  Type 285 radar **19, A** (12, 13)
Renown, HMS 10
Repulse, HMS 10, 26, **D** (28, 29), 43
Richelieu 17
Rodney, HMS **5,** 8, 9, **9, 16,** 30, **32,** 34, **35,** 36, 39, 40–42, **E** (32, 33), **F** (40, 41)
Roosevelt, President Franklin D. 43
Rosyth dockyard **22**
Royal Sovereign class 7, 10, 17

Scapa Flow 42, **43, B** (20, 21), **F** (40, 41)
Scharnhorst 8, 17, **19, 20, 30,** 31, 32, 40, 43, **G** (44, 45)
service history 39–44
service modifications 34–39
Sicily landings (1943) 40, 42, 44
Suez Canal **46**
Supermarine Walrus seaplanes 39

Temeraire, HMS 24
Tennyson d'Eyncourt, Sir Eustace 10, 11–12
Tirpitz 44
Tovey, Admiral Sir John **B** (20, 21), **F** (40, 41)
training ships 42, 44
Treaty of London (1930) 8, 9, 16
Treaty of London (1936) 17, 20
Treaty of Versailles (1919) 7
turrets
  King George V class 18, 31, **D** (28, 29)
  Lion class 24
  Nelson class **10,** 11, 12, **31, 35**
Type 79Y air-warning radar 39
Type 282 fire-control radar **E** (32, 33)
Type 284M fire-control radar 32
Type 285 radar **19, A** (12, 13)

United States
  cost of war 5
  strength of the Navy 5–7, 8, 9
Unrotated Projectors **A** (12, 13)

Vanguard, HMS **26,** 26–27, **27,** 32, 44, **47, C** (24, 25)
Versailles, Treaty of (1919) 7
Vickers-Armstrong shipyard **18, 23,** 24
Vittorio Veneto 8

war graves 43
Washington Treaty 4, 5–10
weapons *see* armament

Yamato class 8, 19

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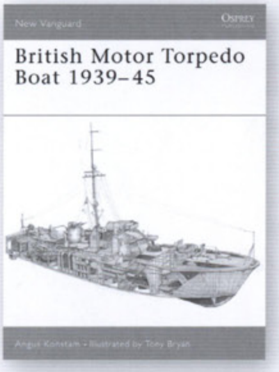
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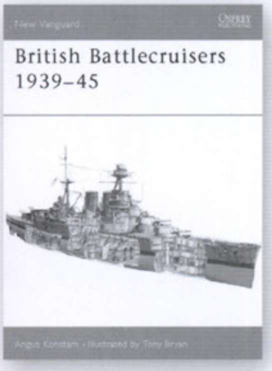
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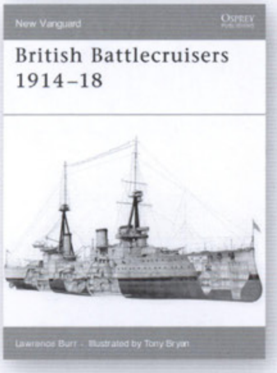
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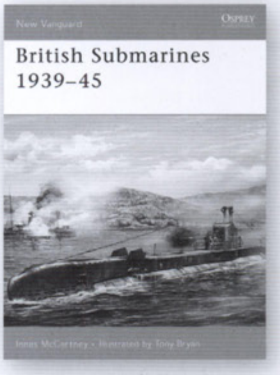
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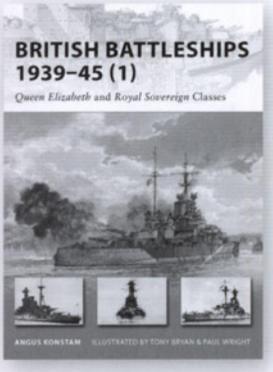
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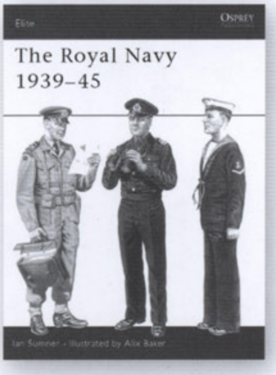
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With the outbreak of World War II, Britain's Royal Navy and her fleet of battleships would be at the forefront of her defence. Yet ten of it's twelve battleships were already over twenty years old, having served in World War I, and required extensive modifications to allow them to perform vital service throughout the six long years of conflict. This title offers a comprehensive review of the seven battleships of the *Nelson* and *King George V* classes, from their initial commissioning to their peacetime modifications and wartime service. Moreover, with specially commissioned artwork and a dramatic re-telling of key battles, such as the duel between the *Bismark* and HMS *Rodney*, this book highlights what it was like on board for the sailors who risked their lives on the high seas.

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